

Department of Agriculture

TRINIDAD AND TOBAGO

Vol. II.]

[Part 3.

FLORA

OF

TRINIDAD AND TOBAGO

EBENALES

Sapotaceae (*by A. W. Hill and N. Y. Sandwith*)

Ebenaceae, Styracaceae, Symplocaceae

(*by E. E. Cheesman*)

GENTIANALES

Oleaceae, Apocynaceae, Asclepiadaceae,

Loganiaceae (*by E. E. Cheesman*)

Gentianaceae (*by R. O. Williams and E. E. Cheesman*)

POLEMONIALES (pars)

Hydrophyllaceae (*by R. O. Williams*)

Price : — — \$1.20



TRINIDAD :
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COHORT 6. EBENALES

- Latex present 1. Sapotaceae
- Latex absent
- Fls. unisexual 2. Ebenaceae
- Fls. hermaphrodite
- Ovary superior, 3-5-locular below, 1-locular above 3. Styracaceae
- Ovary inferior, completely 2-5-locular 4. Symplocaceae

FAMILY 1. SAPOTACEAE

By

A. W. HILL AND N. Y. SANDWITH *

Trees and shrubs, laticiferous. *Lvs.* simple, entire, alternate or opposite, penninerved. *Stip.* (*Ecclinusa* and *Manilkara* only) caducous. *Infl.* in the leaf axils or cauliflorous, usually in panicles. *Fls.* regular, hermaphrodite or rarely polygamous. *Sep.* free or more or less connate, usually 4-6, rarely up to about 10, sometimes in distinct whorls. *Cor.* tube well developed or short, lobes 5-8 imbricate or rarely valvate; *staminodes* petaloid, lanceolate or linear, sometimes absent. *Stam.* equal to *cor.* lobes and opposite them. *Anth.* dehiscing longitudinally by slits often extrorsely. *Ovary* superior, hairy or glabrous, 1-12-locular; *style* single; *stigma* terminal, capitate. *Fruit* indehiscent, pericarp fleshy or woody; *seeds* with a horny or glossy testa.

Corolla rotate, lobes with dorsal appendages 8. *Manilkara*

Corolla lobes without dorsal appendages.

Staminodes absent.

Stipules present; flowers sessile in clusters on the stems 1. *Ecclinusa*

* Manuscript completed January 1940.

Stipules absent; flowers pedicellate
in axillary clusters 4. **Chrysophyllum**

Staminodes present.

Sepals about 10, imbricated in 3-4
series 9. **Calocarpum**

Sepals 4-6 in 1-2 series.

Ovary glabrous.

Flowers almost sessile in dense
axillary clusters; leaves
large, ovate or broadly
elliptical, with long
petioles 5. **Sideroxylon**

Flowers pedicellate in few-
flowered or dense axillary
clusters; leaves smaller,
narrowly elliptical or obo-
vate with short petioles 7. **Bumelia**

Ovary hairy:

Staminodes petaloid, almost as
large as corolla segments;
ovary 10-12-locular 6. **Achras**

Staminodes linear or linear-
lanceolate, much smaller
than corolla lobes; ovary
not more than 8-locular.

Leaf veins crowded at right
angles to midrib, obscured
by dense felt of hairs on
under side of leaf 3. **Micropholis**

Leaf veins distant and pro-
minent (penninerved), in-
clined upwards at an angle
of 45° with midrib 2. **Pouteria**

1. **ECCLINUSA** Mart.

Trees. *Lvs.* alternate. *Stip.* caducous (not seen in the Trinidad material). *Fls.* sessile, axillary and cauliflorous. *Sep.* 5 (4-6). *Cor.* lobes 5 (4-6), imbricate. *Staminodes* absent. *Stam.* equal to cor. lobes. *Ovary* 5-locular, hairy, globose. *Fruit* subglobose; *seeds* with smooth testa and oblong scar, exalbuminous.

1. **E. Grisebachii** Pierre. Not. Bot. Sapot. 57

Tree. *Lvs.* obovate, elliptical, acute or acuminate, 12-20 cm. long, 5-8 cm. broad, tapering to the base, papery, glabrous above and below, but mid-ribs, petioles and young branches covered with fine hairs; lateral veins prominent, ascending at an angle of 45° to the mid-rib, petioles 1-1.5 cm. long. *Fls.* sessile in axillary clusters or cauliflorous. *Sep.* 5, rounded, pubescent outside, margins hyaline, glabrous. *Cor.* 3 mm. long, tube short, segments 5, with pubescent patches in centre on the back. *Stam.* 1.25 mm. epipetalous. *Ovary* hairy at base. *Style* 0.5 mm. *Fruit* ovoid, 5-6 cm. long.

"Botanic Garden, but indigenous," Crueger 157, Herb. Trin. 654, in Herb. Trin. and Herb. Kew.

Known only from Trinidad.

2. **POUTERIA** Aubl. emend. Eyma.

Trees. *Lvs.* alternate, penninerved. *Fls.* in axillary fascicles or above leaf scars. *Sep.* 4-5. *Cor.* lobes 4-6, entire, imbricate. *Staminodes* inserted on the throat, subulate or lanceolate. *Stam.* as many as corolla lobes. *Ovary* hairy, 1-8-locular. *Fruit* ovoid or globose. *Seeds* not much compressed, with smooth, glossy testa.

Leaves usually less than 12 cm. long. Flowers small, on long pedicels in dense axillary clusters; corolla very small, 2.5 mm. long, with 4 segments 3. *P. minutiflora*

Leaves usually more than 12 cm. long. Flowers rather large, few, sessile or shortly stalked in leaf axils; corolla not small, at least 6 mm. long.

Leaves about 9-18 cm. long, oblanceolate. Flowers almost sessile in small axillary clusters; corolla segments 4; fruit globose or ovoid, 3-7 cm. in diameter . 4. *P. Caimito*

Leaves 10-28 cm. long, usually broadly obovate-lanceolate; flowers pedicellate in axillary clusters; corolla segments 6; fruit pyriform, 3.5-4.5 cm. in diameter 1. *P. multiflora*

Leaves large, usually 27-40 cm. long, broadly obovate, tapering from above middle to the base. Flowers sessile, one or two in leaf axils; corolla segments 4; fruit globose, 5-7.5 cm. in diameter 2. *P. Hartii*

1. *P. multiflora* (A.D.C.) Eyma Penny Piece
Pain d'epice
Lucuma multiflora A.D.C.

Eyma in Rec. Trav. Bot. Néerl. 33. 164; Hemsl. in Hook. Ic. Pl. t. 2498; Pierre & Urb. in Urb. Symb. Ant. 5. 102; Britt. & Wils. Sci. Surv. Porto Rico, 6. 67; Marshall, Silviculture of the Trees of Trinidad and Tobago (1939) 157; not Griseb. Fl. 402.

Lvs. coriaceous, obovate-elliptical or oblong, acute or subacute, tapering to the base, glabrous, penninerved, main veins prominent, distant, glabrous, 10-28 cm. long, 6-9 cm. broad; *petioles* 2 mm. long; *fls.* in axillary clusters or cauliflorous; *pedicels* 0.6-1 cm. long, pubescent; *cal.* segments 4, 2 outer broadly rotund, 4.5 mm. long, 5-5.5 mm. broad, glabrous, with finely ciliate margins, 2 inner membranous, elliptical, deeply emarginate, margins ciliate; *cor.* 7-8 mm. long, lobes 6, 3 mm. long, orbicular, truncate or slightly emarginate. *Stam. fls.* 1 mm. long, *anthers* 1.75 mm. long, extrorse; *staminodes* subulate, 2-2.5 mm. long with lateral flanges, extrorsely concave; *ovary* 4-locular, densely hairy, broadly conical; *style* 5 mm. long; *fruit* pyriform or ovoid, slightly reniform, 5.5-6 cm. long, 3.5-4.5 cm. broad, 1-seeded; *seed* oblong, curved, 3.5 cm. x 1.5 cm.

Occasional in forests in the Northern Range at lower elevations.

Guapo, Herb. Trin. 6961; Coblentz, J. H. Hart, Herb. Trin. 4470, 4390, 4675, 5541; Port-of-Spain, Woodford Square (planted), W. E. Broadway 9210; Maraval, Baptiste, Herb. Trin. 5858; Arima, J. Dannouse (1904); Herb. Trin. 6013; Hart, Herb. Trin. 664.

West Indies, Porto Rico to Trinidad.

2. **P. Hartii** (Hemsl.) Dubard
Lucuma Hartii Hemsl.

Contravent

Hemsl. in Hook. Ic. Pl. t. 2565: Pierre & Urb. l.c. 107: Marshall l.c. 156: Dubard in Ann. Mus. Col. Marseille, Ser. 2. 10. 34.

Tree, branches at first ferruginous, puberulous; *lvs.* coriaceous, large, lanceolate or oblanceolate, acuminate, glabrous above, puberulous below, 15-45 cm. long, 8-13 cm. broad, penninerved, with conspicuous lateral nerves inclined upwards; *petioles* 2.5-5 cm. long, puberulous; *fls.* few, sessile, in leaf axils; *sep.* 4, 2 + 2, orbicular; *cor.* 6 mm. long, segments 4, margins ciliate; *staminodes* triangular, ligulate, 1 mm. long; *stam.* and *filaments* 2.5 mm.; *anthers* 1.5 mm.; *ovary* hairy, 4-locular; *style* 6 mm. long; *fruit* globose, orange, edible, 5-8 cm. in diameter, 1-seeded; *seeds* oblong-cylindric with narrow hilum.

Occasional in lower montane rain forest, Northern Range, Trinidad.

Maraval, Baptiste, Herb. Trin. 4324, 4473, 4542, 5982; Moruga, J. H. Hart, Herb. Trin. 6800; Herb. Trin. 6540; St. Anne's, S. Devenish, Herb. Trin. 3027; Morne Pierre above Macqueripe, R. C. Marshall, Herb. Trin. 12699. "Practically confined to the Western half of the Northern Range," *vide* Marshall.

Endemic in Trinidad, as far as is known.

3. **P. minutiflora** (Britton) Sandwith Monkey Balata
 Mal Balata
Chrysophyllum minutiflorum Britton Coco Macaque
 "C. sericeum A. DC?" of Marshall, l.c. 155.

Britton in Bull. Torrey Bot. Cl. 48. 337: Sandwith in Kew Bull. 1931. 478.

Tree about 15 m. high; *lvs.* thin-chartaceous, oblong-lanceolate, 6-15 cm. long, 2.5-4.5 cm. broad, acuminate, tapering to the base, penninerved, lateral nerves channelled above, fairly prominent below, curving upwards, glabrous, but young leaf-buds puberulent; *petioles* 1-1.5 cm. long; *fls.* small, green, in axillary fascicles and cauliflorous, *pedicels* slender, 5-8 mm. long; *cal.* 4 segments, broadly rotund, slightly pubescent outside, margins hyaline, 1 mm. long, 1.75 mm. broad; *cor.* pubescent on outside, 2.5 mm. long, tube 1.75 mm. segments 4, triangular; *stam.* inserted almost at base of tube, *filaments* 1 mm. long, *anthers* 0.5 mm.; *staminodes* linear, 0.75 mm. long; *ovary*

globose, covered with felt of erect hairs; *style* glabrous, 1 mm.; *fruit* ovoid, with conical apex, 3.5-3.8 cm. long, 2-2.3 cm. broad, 1-seeded; *seed* ovoid, slightly compressed, testa shiny, wrinkled, 2.2 cm. x 1.8 cm.

Common in forests in the lowlands, particularly in the drier areas, Trinidad.

Purgo Macho, Maracas, Crueger 247, Herb. Trin. 652; Maraval, Baptiste, Herb. Trin. 4474; Santa Cruz, J. Dannouse (1901); Arima, J. Dannouse, Herb. Trin. 8317; Herb. Trin. 1301; 661; 965; Iros Forest, W. E. Broadway 8581; Prestoe 1454; Arena Reserve, R. L. Brooks, Herb. Trin. 12329; Yassa river woods near coast, C. Swabey, Herb. Trin. 12908; Southern Watershed Reserve, F. R. Russell, Herb. Trin. 12644; Arima Forest, Britton 2403 in Herb. Trin. 11307; Mount St. Benedict, Cheesman, Herb. Trin. 13456.

British Guiana.

4. **P. Caimito** (*R. & P.*) Radlk. Yellow Star Apple
Achras Caimito R. & P.
Eyma in Pulle, Fl. Surin. 4. 1. 369.

Tree; *lvs.* somewhat coriaceous, oblanceolate, subacute or acute, tapering to the base, penninerved, lateral nerves prominent, inclined at an angle of 45° with the mid-rib, glabrous, 9-18 cm. long, 3.5-5 cm. broad; *petioles* 1 cm. long, glabrous; *fls.* in small axillary fascicles, almost sessile; *cal.* segments 4, 2 outer rounded, slightly pubescent on back, 2 inner more membranous, 3.5 mm. long, with pubescent median patches; *cor.* 6 mm. long; tube 2.5 mm. long; segments 4, obovate, subacute, margins ciliate; *stam. filaments* 2.5 mm. long, *anthers* 1.5 mm.; *ovary* 2 mm. long, covered with erect hairs; *style* glabrous, 5 mm. long; *fruits* yellow, globose or ovoid, up to about 7 cm. in diameter, apparently variable in shape and size.

Hort. Trinidad, J. H. Hart, Herb. Trin. 7005, "introduced from Brazil;" planted in Botanic Garden, W. E. Broadway 9235; Arima, J. Dannouse (1905), (1906), in Herb. Trin.

Tropical S. America, sometimes cultivated.

Doubtful Species

Pouteria coriacea Pierre; Pierre & Urb. l.c. 109.

Lvs. oblong, long-acuminate, obtuse at apex, subacute at base, 11-16 cm. long, 4-5.5 cm. broad, glabrous with coriaceous veins 20-24; *petioles* 1.4-2.9 cm. long; *fruit* 3.2 cm. long, 1.7 cm. broad, apex obtuse; *seed* oblong, rounded, hilum linear.

Trinidad; Irois, Crueger 156 in Herb. Griseb., Göttingen.

This species is not represented in the Herbaria at Kew or Trinidad. As it is only a fruiting specimen and it has not been possible to see it, we have included it as a doubtful species.

3. MICROPHOLIS *Pierre*

Trees or shrubs. Lvs. penninerved, with close nervation. *Fls.* in axillary fascicles or above leaf scars. *Sep.* 4-5. *Cor.* lobes 4-5, entire, imbricate. *Staminodes* triangular or linear. *Ovary* subglobose or ovoid, hairy, 4-5-locular. *Fruit* ellipsoid, oblong or ovoid, 1-few-seeded. *Seeds* laterally compressed, with smooth, glossy testa.

1. **M. Cruegeriana** *Pierre* Wild Caimite or Kaimit
Pierre and Urb. l.c. 119.

Tree; branchlets pubescent; *lvs.* elliptic-oblong or obovate-oblong, 11-17 cm. long, 2.5-8 cm. broad, chartaceous, glabrous above, covered with dense rusty-red tomentum below, penninerved, lateral nerves numerous, fine, upwardly inclined, acuminate, rounded or tapering to the base; *petioles* 1-1.5 cm. long, pubescent; *fls.* in axillary fascicles; *pedicels* pubescent, 5 mm. long; *cal.* segments 5, outer broadly ovate, acute, rusty-pubescent, inner more membranous, with median patches of hairs, margins ciliate; *cor.* segments 5, quadrangular, truncate, greenish-cream colour, 3 mm. long; *staminodes* linear 0.75 mm.; *stam.* with *filaments* 1 mm. long, *anthers* bent over; *ovary* and *style* 2 mm., ovary covered with erect, rusty hairs, 5-locular; *fruits* mature, ovoid, about 2 cm. long.

Abundant in rain forests in the Northern Range, Trinidad.

Maracas, Crueger 250; Hart, Herb. Trin. 653; Hart, Herb. Trin. 656; Arima, Blanchisseuse Road, R. C. Marshall, Herb. Trin. 12820, 12962.

Endemic in Trinidad, so far as known.

EXCLUDED SPECIES.

M. chrysophylloides *Pierre* is recorded from Trinidad by Urban in Symb. Ant. 4. 480 (1910), but the evidence is not cited. Probably an error, as there is no Trinidad specimen in Herb. Trin., Herb. Kew, or at Berlin (*vide* Diels). The distribution of this species is West Indies, Porto Rico to St. Vincent.

4. CHRYSOPHYLLUM *L.*

Trees or shrubs. Lvs. alternate, exstipulate. *Fls.* few or several in axillary fascicles or above leaf scars. *Sep.* 5. *Cor.* lobes

5-7, entire, imbricate, *Staminodes* absent. *Stam.* as many as corolla lobes. *Ovary* 5-11-locular. *Style* short. *Fruit* oblong to subglobose. *Seeds* compressed with smooth testa.

Leaves covered on under side with foxy-red, closely felted tomentum, obscuring nerves and veins 1. *C. Cainito*

Leaves somewhat sericeous below especially when young, hairs silvery, veins and nerves prominent 2. *C. argenteum*

1. *C. Cainito* L. Star Apple; Caimite.

Griseb. Fl. 398; Pierre & Urb. l.c. 149; Britt. & Wils. l.c. 68; Eyma in Pulle, Fl. Surin. 4. 389.

Tree; branchlets, petioles and backs of leaves covered with rusty-red, pubescent felt. *Lvs.* from oblong to shortly and broadly obovate-elliptic, cuspidate, rounded to tapering at base, chartaceous or thinly coriaceous, dark green and polished above, rusty-red, pubescent below, 8-16 cm. long, 4-7 cm. broad, pinnerved, lateral nerves numerous, fine, slightly inclined upwards; *petioles* 1-2 cm. long; *fls.* in dense, axillary fascicles; *pedicels* about 1 cm. long, pubescent; *cal.* segments 5, rounded, about 1.25 mm. long and broad, pubescent, edges slightly hyaline; *cor.* about 4 mm. long, segments 6-7, 2 mm. long, triangular, acute, spreading, hairy on outer side, margins reflexed; *stam. filaments* attached at base of segments and curved, inverting the anthers; *anth.* 0.5 mm; *ovary* globular, covered with rusty-red, appressed hairs, 6-11-locular; *style* 0.5 mm., glabrous; *fruit* edible, subglobose, 5-8 cm. long.

Fl. Trin., Sieber 30, Herb. Hook. in Herb. Kew; Woodbrook, planted, W. E. Broadway, Herb. Kew; Atagual, Tabaguite, cult. W. E. Broadway, Herb. Trin. 8722; Maraval, J. Dannouse, Herb. Trin.; J. H. Hart, Herb. Trin. 663, 2198, 4637, 5654, 6542, 6543.

West Indies, Central America, Continental Tropical America (often cultivated).

2. *C. argenteum* Jacq. Wild Caimite, or Kaimite.
C. glabrum Jacq.
C. immersum Urb.

Griseb. Fl. 398; Pierre & Urb. l.c. 153; Urban in Fedde, Rep. Sp. Nov. 15. 414 (1919); Britt. & Wils. l.c. 69; Marshall l.c. 155.

Tree; branchlets, petioles and backs of young leaves finely pubescent with silvery hairs; *lvs.* elliptical, obovate-elliptical or obovate-oblong, acuminate or cuspidate, rounded towards base, more or less coriaceous, 8-14 cm. long, 3-7 cm. broad, penninerved, lateral nerves distinct, inclined upwards; *petioles* 0.8-1.5 cm. long; *fls.* in dense axillary fascicles; *pedicels* 0.5-1 cm. long, pubescent; *cal.* pubescent, segments 5, rounded, 2 mm. long and broad, margins hyaline, ciliate; *cor.* 4.5 mm. long, segments 5, hairy on outer side, 1-1.75 mm. long; *stam.* and *filaments* 1 mm.; *anth.* 0.5 mm.; *ovary* conical, densely hairy, 1.25 mm. long; *style* glabrous, 1 mm. long; *fruits* ovoid to globose, 1.5 cm. long.

Fl. Trin.; Sieber 353, Herb. Kew.; La Ventille (1847), Cruger, Herb. Kew.; Maracas, Crueger 246, Herb. Kew.; Fendler 715, Herb. Kew.; Southern Watershed Reserve, F. R. Russell, Herb. Trin. 12414, 12471, 12682; Hort. Trinidad, J. H. Hart, Herb. Trin. 5437, 6541; St. Clair, J. H. Hart, Herb. Trin. 4593; Maracas, J. H. Hart, Herb. Trin. 660; Maraval, J. Dannouse (1904), Herb. Trin.; Diego Martin, J. Dannouse (1902), Herb. Trin.; Oropouche, Aripira Estate, J. H. Hart, Herb. Trin. 2199; Tamana, R. C. Marshall, Herb. Trin. 12312.

Tobago: Easterfield, Broadway 4411 in Herb. Mus. Brit. (type coll. of *C. immersum*); Belmont, Broadway 3991, in Herb. Kew.; near Little Englishman's Bay, N. Side, forested slope, N.Y. Sandwith 1881 in Herb. Kew.

West Indies, Cuba to Trinidad.

Cultivated Species

C. albidum G. Don, of Tropical Africa, is represented by specimens from a tree growing in the Botanic Garden. Noted by J. H. Hart as "probably indigenous," but there is no other evidence that it is native.

5. SIDEROXYLON L.

Trees or *shrubs*. *Lvs.* alternate, coriaceous or chartaceous, with slender petioles. *Fls.* 5-merous, greenish-yellow or white, in dense axillary or lateral fascicles. *Sep.* obtuse, imbricated. *Cor.* nearly rotate, lobes obtuse. *Anth.* extrorse. *Staminodes* entire or toothed. *Ovary* 5-locular (rarely 2-3), ovules ascending; *style* short. *Fruit* ovoid or subglobose, usually 1-seeded. *Seeds* with crustaceous or woody testa.

1. *S. quadriloculare* Pierre. Acoma; Mastic.

S. foetidissimum Jacq. var. *quadriloculare* (Pierre) Dubard.

Pierre in Urb. Symb. Ant. 5. 133: Dubard in Ann. Mus. Col. Marseille, ser. 2; 10. 83: Marshall l.c. 161.

Tree; young branchlets greyish, pubescent; *lvs.* chartaceous, obovate, 10-14 cm. long, 5.5-7 cm. broad, rounded or subacute at apex, rounded or slightly tapering at the base, glabrous, lateral nerves curving upwards, distinct, margins cartilaginous slightly undulate; *petioles* 2.5-5 cm.; *fls.* in axillary fascicles, *pedicels* 3-4 mm. long, pubescent; *cal.* segments 5, rounded, pubescent, 2-2.5 mm. long; *cor.* 5 mm. long, segments 5, about 2 mm. long, broadly ovate; *staminodes* linear-lanceolate, 1.75 mm. long; *anth.* 1.75 mm. long, extrorse, on filaments 1-1.25 mm. long; *ovary* 5-locular, glabrous, with style 2.75 mm. long; *fruit* golden-yellow *pericarp* fleshy, globular to ovoid, about 3 cm. long, 2-2.5 cm. broad, 1-seeded; *testa* thick, smooth, hilum ovoid.

Occasional throughout forests in Trinidad and Tobago.

Trinidad: Carrera Island, Convict Depot, tree 95 ft. high, W. E. Broadway 7002; also near Victoria Institute—planted—W. E. Broadway 7003, in Herb. Kew; Fendler 714, in Herb. Kew; Port-of-Spain, Frederick Street, H. Bruins-Lich, Herb. Trin. 12968; Botanic Gardens, R. O. Williams, Herb. Trin. 11514; Central Range Reserve, Biche, C. Swabey, Herb. Trin. 12927; San Fernando Hill, W. G. Freeman, Herb. Trin. 7625; Gasparil, Whaling Establishment, J. H. Hart, Herb. Trin. 2202; San Fernando Promenade, J. H. Hart, Herb. Trin. 522; J. H. Hart, Herb. Trin. 657.

Tobago: Chelsea, W. E. Broadway 3143, Oct. 5, 1909.

Endemic in the colony, so far as known.

6. *ACHRAS* L.

Trees. *Lvs.* alternate, leathery, with straight, parallel nervation. *Fls.* large, axillary. *Seps.* 3 + 3. *Cor.* lobes 6, entire or slightly emarginate, imbricate; *staminodes* petaloid, inserted on the throat, as long as corolla lobes. *Ovary* hairy, 10-12-locular. *Style* glabrous, long and slender. *Fruit* a large berry. *Seeds* laterally compressed, not all developed, *testa* smooth with long linear scar.

1. **A. Zapota L.**
Sapota Achras Mill.

Sapodilla

Cook in Contr. U.S. Nat. Herb. 16. 285, pl. 101 : Eyma in Pulle, Fl. Surin. 4. 395 : Pierre & Urb. l.c. 96 : Griseb. Fl. 399 (as *Sapota Achras*) : Britt. & Wils. l.c. 65 (as *Sapota Achras*, not *A. Zapota* p. 67).

Tree; branchlets and petioles brownish-tomentose; *lvs.* congested at end of branchlets, elliptic-oblong to lanceolate-oblong, acute or emarginate, 5-15 cm. long, 3.6 cm. broad, chartaceous, glabrous above, often brownish-tomentose below, nerves numerous, almost straight, inconspicuous; *petioles* 1-2 cm. long, pubescent; *fls.* usually solitary in leaf axils; *pedicels* pubescent, 1-1.5 cm. long; *sep.* 5-6, in two whorls, 7 mm. long, 3-4 mm. broad, tomentose outside, margins membranous; *cor.* white, 8-10 mm. long, lobes 6, erect, oblong, about as long as tube; staminodes petaloid, as long as petals, often bifid at the apex; *stam.* with short curved filaments; *anth.* 1.5 mm. long; *ovary* conical, covered with hairs, 10-12-locular, *style* glabrous; *fruit* globose, 5-8 cm. in diameter; style and calyx persistent; *seeds* brown or black, shiny.

Commonly planted, Trinidad and Tobago.

Trinidad, B. de Schach, Fendler 1025, Fendler 220, all in Herb. Kew; The Valley (1906), Needham, Herb. Trin.; J. H. Hart, Herb. Trin. 655, 2201, 4051.

West Indies, Cont. Trop. America (often cultivated).

7. **BUMELIA Sw.**

Trees or shrubs; branches often spinescent. *Lvs.* sometimes clustered at the nodes. *Flowers* small, pedicelled in axillary fascicles. *Cal.* segments 5, unequal. *Cor.* 5-lobed, with a pair of lobe-like appendages at each sinus. *Stam.* 5, anthers sagittate; staminodes petaloid. *Ovary* 5-locular; style filiform. *Fruit* a small berry with fleshy pericarp, 1-seeded. *Seed* coat shining, hilum basal.

Leaves narrowly lanceolate to elliptic, acute or acuminate, finely hairy on lower surface when young, glabrous later. Stems with spinous branches, gall-bearing. Flowers in axillary clusters (3-7). Style ultimately 9 mm. long 1. *B. Grisebachii*

Leaves usually more or less obovate, rounded and obtuse at the apex, commonly emarginate, finely pubescent below. Stems with spinous branches. Flowers in dense axillary clusters. Style ultimately 3-3.5 mm. long

2. *B. buxifolia*

1. **B. Grisebachii** Pierre

Acoma piquant
Cockspur Acoma

B. buxifolia Willd. ex R. & S. sens. Griseb. Fl. 402 non Willd. ex R. & S.

Pierre in Urb. Symb. Ant. 5. 141: Dubard, l.c. 75: Marshall l.c. 154.

Tree with spiny branches; young branches and young leaves pubescent; *lvs.* narrowly lanceolate, elliptic-oblong or elliptic, acute to acuminate, narrowing to the base, glabrous above, subglabrous or with a few scattered hairs below, 6-9 cm. long, 2-2.8 cm. broad, lateral nerves fine, inclined upwards; *petioles* pubescent, 1-1.5 cm. long; *fls.* in few-flowered, axillary fascicles; *pedicels* pubescent, 5 mm. long; *sep.* 5, outer 3.5-4 mm. long, pubescent on the back, inner 4.25 mm., more membranous, ovate, subacute; *cor.* segments 5, 4-5 mm. long; appendages 2-2.5 mm. long, erect, subulate-lanceolate, acute, infolded; *anth.* sagittate, 1.5 mm. long, extrorse, on filaments 1 mm. long; *ovary* about 1 mm., densely hairy; *style* 3 mm. long when young, elongating to 9 mm., glabrous; *fruits* not seen.

The specimens are usually infected with conical galls covered by numerous small, imbricated scales with membranous margins.

Rare in forests in the drier areas of Trinidad, principally in the South.

Savanilla Woods, Cruieger, Herb. Trin. 541; Brasso-Tamana Road, Basin Hill reserve, R. C. Marshall, Herb. Trin. 12276 and 12297; also F. R. Russell, Herb. Trin. 12272; Moruga, Edward Trace, W. E. Broadway, Herb. Trin. 8200.

Endemic in Trinidad, as far as known.

2. **B. buxifolia** Willd. ex R. & S.
B. Cruegerii Griseb. Fl. 401.

H.B.K. Nov. Gen. et Sp. Pl. 7. 212, t. 647; Pierre and Urb. l.c. 142 (*B. buxifolia*), 141 (*B. Cruegerii*): Dubard l.c. 75: not Griseb. Fl. 402.

Tree, small with spiny branches; young branches finely pubescent; *lvs.* obovate or elliptic-obovate, sometimes wider below the middle, 3-6 cm. long, 2.5-3 cm. broad, apex rounded and usually emarginate, base cuneate, lateral nerves ascending, glabrous above, finely pubescent below; *petioles* about 1 cm. long, pubescent; *fls.* in dense axillary fascicles; *pedicels* 3-4 mm. long, finely pubescent; *cal.* segments 5, ovoid, rounded, finely pubescent outside, outer 1.5 mm., inner 1.75-2 mm. long; *cor.* segments 5, 3 mm. long, tube 1.25 mm. long, spreading, rotate with edges infolded enclosing the staminal filaments, ovoid-triangular, acute; appendages subulate, acute, erect, 2 mm. long; *stam.* exerted a little beyond corolla lobes, inverted, filaments 2 mm. long; *ovary* globose, 0.75 mm. long, subglabrous with few scattered hairs; *style* 2.5 mm., later up to 3.5 mm., glabrous; *fruit* cylindrical-ovoid, 1.4 cm. long, 7 mm. broad, striated.

A sea-shore species.

Trinidad, Chacachacare, 'forma spinosa,' Crueger 248, Herb. Trin. 658; Crueger (Aug. 1847), Herb. Trin. 659; Pointe Gourde, W. E. Broadway 8085; Union Bay, Herb. Trin. 3503, 3504 in Herb. Kew; Monos Islands, R. O. Williams, Herb. Trin. 9668; Monos (1867) Herb. Trin. 2197; Herb. Trin. 2196; Gasparce Island, N. L. Britton and W. E. Broadway, Herb. Trin. 9643.

Venezuela. (Also on Patos Island, Broadway 7219).

Note:—Pierre and Urban identified *Herb. Trin.* 2196 with *B. buxifolia*, retaining *B. Cruegeri* for Crueger 248, but after careful comparison both of this material and of the description of *B. buxifolia* we find no evidence for treating these two specimens as distinct species and have therefore reduced *B. Cruegeri* to *B. buxifolia*.

8. MANILKARA Adans.

Trees. *Lvs.* alternate, leathery, nerves almost at right angles to mid-rib, glabrous, stipules subulate, caducous. *Fls.* in axillary fascicles or above leaf scars. *Sep.* 3 + 3. *Cor.* lobes 6, entire, each with two petaloid, dorsal appendages; staminodes

6. *Stam.* 6. *Ovary* conical, 6-14-locular. *Fruit* globose or subglobose, pericarp firm, few-seeded. Seeds compressed laterally, testa smooth.

1. ***M. bidentata*** (A.DC.) Chev. Balata
Mimusops bidentata A.DC.
Mimusops Balata Auct.
Mimusops globosa Gaertn. f. sens. Griseb. Fl. 400.

Chevalier in Rev. Bot. Appl. 12. 270 (1932) : Eyma in Pulle, Fl. Surin. 4. 398 : Pierre & Urb. l.c. 164 (as *M. Balata*) : Marshall. l.c. 157 (as *M. Balata* var. *Cruegeri* Pierre).

Tree: *lvs.* leathery, elliptic or oblong-obovate, acute or obtuse, 10-20 cm. long, 5-8 cm. broad, with dense, grey, velvety tomentum below or subglabrous, lateral veins numerous, almost straight; *petioles* 2.5-4 cm. long; *fls.* at apex of branches; *pedicels* 2-3 cm. long; *sep.* 6, 3 outer ovate, rounded at apex, 4.5 mm. long, 3 mm. broad, tomentose at the base, 3 inner more elliptical, all concave; *cor.* 4-6 mm. long, tube 1 mm., lobes and petaloid appendages rotate, broadly lanceolate, acute or rounded; *stam.* erect, 2 mm. long, opening extrorsely; *staminodes* lanceolate, erect; *ovary* and *style* glabrous, 5 mm. long, 6-locular; *fruit* globose, about 3 cm. in diameter, 1-2-seeded.

Occasional throughout the forests of Trinidad, becoming gregarious coastally.

Trinidad, Crueger 158 : 68 ; Fl. Trin., Sieber 33 ; Fendler 491, all in Herb. Kew ; Rio Claro, (N. Barnard), R. C. Marshall, Herb. Trin. 11599 ; Hort. Trin., J. H. Hart, Herb. Trin. 5378 ; 4784 ; Circular Road, Monsoupin Cottage Grounds (1866), Herb. Trin. 2200 ; Maracas, Road to the Waterfall, W. E. Broadway 6973.

Barbados (?), Guiana, Venezuela, Brazil (?).

Note :—Pierre and Urban, Symb. Ant. 5. p. 165, 166, cite three varieties of *Mimusops Balata* from Trinidad, var. a. *Cruegeri* Pierre (*Crueger* 158), var. c. *Sieberi* Pierre (*Sieber* 33) and var. d. *Harti* Pierre (*Hart* 4784, *Broadway* 5378). From the Trinidad material available, there is not sufficient evidence for distinguishing these three varieties, which appear to be based mainly on small variations in the leaves and flowers. It seems better, therefore, until a wider range of specimens can be collected, to refer all the Trinidad material to the species without further definition.

9. CALOCARPUM *Pierre*

Trees; twigs pubescent. *Lvs.* alternate, chartaceous. *Fls.* white, in dense sessile clusters on old wood. *Sep.* about 10 in 3-4 series. *Cor.* with 5 segments, lobes longer than tube, imbricate, silky on back; *staminodes* 5, linear, often bearing anthers. *Stam.* 5. *Ovary* 5-locular, seated on a short, cushion-like, hairy disc. *Fruit* a large, 1-seeded, oblong or ovoid berry. *Seeds* oblong, boat-shaped.

1. *C. mammosum* (L.) *Pierre* Mamey Sapote

Achras mammosa L.

Achras Zapota L. *Sp. Pl.* (1753) 1190 p.p.

Achradelpha mammosa (L.) Cook.

Pierre & Urb. l.c. 98; *Britt. & Wils. l.c. 67* (as *Achras Zapota*); *Cook l.c. 285*.

Tree; twigs pubescent or villous; *lvs.* oblanceolate or obovate-elliptic, strongly pinnately veined, 15-25 cm. long, glabrous or puberulent beneath, acute, abruptly acuminate, obtuse or rounded, cuneate at the base; *petioles* stout, 2-4 cm. long, often pubescent; *fls.* almost sessile, usually densely clustered; *sep.* rounded, about 3 mm. long, silky; *cor.* about 1 cm. long; *fruit* rugose, about 15 cm. long.

Planted, and possibly sometimes spontaneous after planting, Trinidad. *Herb. Trin.* 4464 and 4475, collected in 1891 in "Hort. Trin." and at Maraval were evidently taken from cultivated trees.

Jamaica, Cuba, Guadeloupe to Trinidad; continental tropical America.

FAMILY 2. EBENACEAE

By E. E. CHEESMAN *

Trees or shrubs, without latex, their heart-wood often hard and sometimes black. *Lvs.* alternate, entire, usually leathery, without stipules. *Fls.* axillary or at the nodes of older wood, solitary or clustered, usually unisexual, often dioecious. *Cal.* 3-7-lobed, persistent and often increasing on the fruit. *Cor.* 3-7-lobed. *Stam.* in the male flowers usually 2-4 times the number of the corolla lobes, sometimes the same number, inserted below the ovary or on the bottom of the corolla; in the female flowers imperfect or none. *Ovary* in the male flowers rudimentary; in the female superior, several-locular; *style* often 2-8-fid; *ovules* 1-2 in each loculus, pendulous. *Fruit* a leathery or fleshy berry, often by abortion few-locular and few-seeded. *Seeds* with a thin testa and copious endosperm.

1. DIOSPYROS L.

Fls. dioecious. *Cal.* usually 3-4-5-lobed, pubescent, increasing on the fruit. *Cor.* 3-4-5-lobed, more or less pubescent. *Stamens* in the male usually 3-16; *staminodes* in the female usually present but fewer, sometimes none. *Ovary* in the female conical or globose; *styles* or style branches 1-4; loculi of the ovary as many and 2-ovulate, or twice as many and 1-ovulate. *Fruit* conical or globose, often fleshy.

Flowers 4-5-merous, fruit 4-5 cm. in diameter 1. *D. ierensis*

Flowers 3-merous, fruit 1.5-2 cm. in diameter 2. *D. inconstans*

1. *D. ierensis* Britton

Bois Charbon

Britton in Bull. Torr. Bot. Club 48. 336: Marshall, Sylv. Trin. & Tob. 164 (1939): Sandwith in Kew Bull. 1939 p. 15.

Evergreen tree, 12 m. or more high, with a black bark, having a charred appearance; young twigs glabrous or more or less adpressed-pubescent; *lvs.* oblong to elliptical, 10-15 cm. long, up to 7 cm. wide, bluntly short-acuminate at apex, nar-

* The writer is indebted to Mr. N. Y. Sandwith for checking manuscripts of this and the following families at Kew in 1940.

rowed or obtuse at base, shining dark green above, prominently net-veined beneath, on *petioles* 10-14 mm. long; *fls.* about 1.5 cm. across, in 2-3-flowered axillary cymes; *cal.* lobes thick, broadly triangular-ovate, about 1 cm. long and wide, on the fruit nearly flat, and wrinkled; *cor.* about as long as the calyx, its *lobes* narrowly triangular or almost subulate, densely pubescent within and without; *fruit* subglobose, 4-5 cm. in diameter, yellow when ripe, containing about 7-8 seeds.

Forests, Trinidad. Widely distributed but nowhere plentiful, according to Marshall; type from Mt. Tucuche.

British Guiana.

2. *D. inconstans* Jacq.

Butterwood

Maba inconstans (Jacq.) Griseb.

Griseb. Fl. 404: Hiern, Mon. Ebenaceae, p. 128 (1873); Marshall Sylv. Trin. & Tob. 165 (1939).

Small evergreen *tree*, 3-7 m. high, with smooth bark; young *branchlets* ashen grey; *lvs.* oblanceolate to obovate-oblong, 6-13 cm. long, 2.5-6 cm. wide, bluntly acuminate or obtuse, sometimes rounded, at apex, narrowing at base to a *petiole* about 5 mm. long; *fls.* green, axillary or at nodes below the leaves, solitary or clustered several together; *cal.* divided nearly to the base, its *lobes* thick, broadly ovate, usually 3 but occasionally 4 in number, about 8 mm. long, persistent and reflexed on the fruit; *cor.* shorter than the calyx, with narrower pointed lobes, silky-hairy without; *berry* globose, 1.5-2 cm. in diameter; *seeds* brown, about 1 cm. long, up to 6 in number.

Wooded hillsides in the drier areas, and near the sea, Trinidad and Tobago.

St. Vincent, Grenadines and Martinique; Colombia, Ecuador and Brazil.

Cultivated Species.

D. malabarica (Desr.) Kostel (*D. Embryopteris* Pers.), the Gaub Tree, and *D. discolor* Willd. (*D. Mabola* Roxb.), the Mabolo, are grown in the Botanic Gardens and sometimes planted.

FAMILY 3. STYRACACEAE

BY E. E. CHEESMAN

Trees or *shrubs*, often with stellate or scaly hairs. *Lvs.* alternate, without stipules. *Fls.* regular, hermaphrodite, in axillary or terminal racemes. *Cal.* tubular, more or less joined to the ovary, its lobes or teeth valvate or open. *Cor.* 4-7-lobed, rarely of free petals. *Stam.* sometimes the same number as the corolla lobes and alternate with them, more often twice as many, more or less joined to the corolla tube. *Ovary* superior to half-inferior, 3-5-locular; *style* slender, 3-5-lobed; *ovules* single or few in each loculus. *Fruit* usually a berry or drupe, sometimes capsular.

1. STYRAX L.

Fls. usually white, in short loose racemes. *Cal.* bell-shaped, very shortly adnate to the base of the ovary or almost entirely free, the limb truncate or minutely 5-toothed. *Cor.* of 5 petals, shortly joined at the base, rarely to the middle. *Stam.* 10, inserted at the base of the corolla or rarely higher. *Ovary* 3-locular. *Fruit* globose or oblong, dry or fleshy, usually with a single seed.

1. *S. glaber* Sw. var. *micranthus* Perkins

Perkins in Engler, Pflanzenreich, IV. 241, p. 63 (1907).

Tree; *branchlets* and under-surfaces of leaves scaly; *lvs.* ovate-elliptical to oblong-elliptical, 5-12 cm. long, 2-6 cm. wide, acuminate at apex, acute or bluntish at base, glabrous above, whitish beneath with a dense stellate-scaly indumentum; *petioles* 7-12 mm. long; *pedicels* 3-4 mm. long; *cal.* cup-shaped, 4 mm. long and 4 mm. across the mouth, scaly, with 5 minute or obsolete teeth; *cor.* about twice as long as the calyx.

Trinidad; Crueger 104 in Herb. Kew.; Herb. Trin. 852, Heights of St. Anne's, Dec. 1860; 964 without locality; McLean, without number, Arima, Feb. 1904. Not recently collected.

The variety, distinguished by its small flowers and ovate fruit, is endemic in Trinidad. Typical *S. glaber*, with corolla lobes 1.7 cm. long occurs in the Lesser Antilles.

Cultivated Species

S. Benzoin Dryand. has been grown in the Royal Botanic Gardens.

FAMILY 4. SYMPLOCACEAE

Trees or shrubs. Lvs. alternate, without stipules. *Fls.* regular, hermaphrodite, axillary or terminal, solitary or in spikes, racemes or clusters. *Cal. tube* more or less joined to the ovary, its lobes valvate. *Cor.* 3-11-lobed, with a short tube. *Stam.* inserted on the corolla, usually numerous, in 1-4 series. *Ovary* inferior or half-inferior, 2-5-celled; *style* slender, scarcely lobed; *ovules* 2 in each cell. *Fruit* a berry or drupe; *seeds* solitary in each cell, or by abortion less in number than the cells, sometimes only one.

1. SYMPLOCOS L.

The only genus.

Inflorescence branchlets whitish-pubescent;

cal. lobes rounded 1-1.5 mm. long 1. *S. martinicensis*

Inflorescence branchlets densely rusty-hairy;

cal. lobes pointed, 2-3 mm. long 2. *S. guianensis*

1. *S. martinicensis* Jacq.

Griseb. Fl. 403: Brand in Engler, Pflanzenreich, IV. 242, p. 85 (1901): Britt. & Wils. Sci. Surv. Porto Rico 6. 75.

Tree 5-15 m. high; *lvs.* elliptical to obovate, 4-13 cm. long, 2-5 cm. wide, acuminate at apex, acute to blunt at base, usually conspicuously crenate-dentate along the margins, with scattered pubescence on the lower surface when young, becoming glabrous or nearly so; *petioles* 5-15 mm. long; *fls.* in compact axillary clusters little longer than the petioles; *cal. lobes* broadly ovate to rounded, 1-1.5 mm. long and wide, fringed on the margins; *cor.* (white, 9-15 mm. long, its lobes oblong or obovate-oblong — ex Britt. & Wils.; no mature corollas on our material); *fruit* oblong, 8-12 mm. long, 5-7 mm. in diameter, (bluish black ex Britt. & Wils.).

Trinidad: Herb. Trin. 966 (cited by Brand); Fendler 1027 in Herb. Kew.; Broadway 5896, Diego Martin, July 29th 1920, in Herb. Kew.; and collections by Dannouse from St. Anne's, Santa Cruz, Arouca and Arima in 1905 or earlier.

Porto Rico, Virgin Is., Lesser Antilles.

2. *S. guianensis* (Aubl.) Gurke

Ciponima guianensis Aubl.

Symplocos Ciponima L'Herit.

Griseb. Fl. 403: Brand in Engler, Pflanzenreich, l.c. p. 83.

Shrub; *lvs.* elliptical to narrowly oblong, 3-11 cm. long, 1.5-4 cm. wide, varying from very acute to rather abruptly acuminate at apex, rounded at base, only minutely and inconspicuously dentate along the margins, rusty pilose beneath, with long brown hairs rather conspicuous on the midrib and scattered on the lamina, but tending to become glabrous with age; *petioles* about 5 mm. long; *fls.* in compact axillary clusters, fragrant (ex Broadw.); *cal. lobes* lanceolate to triangular, 2-3 mm. long, 1 mm. wide or less, fringed on the margins with rather long soft hairs; *cor.* white, about 7 mm. long, its lobes obovate or oblong, rounded or blunt; *fruit* (ex Brand) globose, 6 mm. long.

Trinidad. Woods near Aripo, Purdie 102 in Herb. Kew. (1848); Aripo Savannah, Broadway in Herb. Trin. 10180 (August 1922); Aripo Road *via* Arima, near 3rd milepost, Broadway 5842 in Herb. Kew. (Oct. 1925).

Guiana, N. Brazil.

COHORT 7. GENTIANALES

- Stamens fewer than the corolla lobes
(usually 2) 1. **Oleaceae**
- Stamens as many as the corolla lobes
- Plant with milky latex
- Fls. without corona; filts. usually
distinct; pollen translators absent;
styles joined below the apex 2. **Apocynaceae**
- Fls. with corona; filts. often joined;
pollen translators present; styles
free up to the common stigma 3. **Asclepiadaceae**
- Plant without milky latex
- Ovary 2-celled; stip. present 4. **Loganiaceae**
- Ovary 1-celled; stip. absent 5. **Gentianaceae**

FAMILY 1. OLEACEAE

By E. E. CHEESMAN

Erect or climbing *shrubs* or *trees*. *Lvs.* opposite, rarely alternate, simple or pinnate, entire or toothed. *Stip.* none. *Fls.* hermaphrodite, rarely unisexual, regular. *Cal.* usually small, 4-toothed, occasionally wanting. *Cor.* gamopetalous, polypetalous (as in the local genus) or wanting; petals when present usually 4. *Stam.* 2, sometimes 4, inserted on the corolla tube or at base of petals, hypogynous when petals wanting; *filts.* short. *Ovary* superior, 2-celled; *ovules* 2 (rarely 1 or 4-8) in each loculus; *style* usually short; *stig.* capitate or bifid, glabrous. *Fruit* a loculicidal capsule or a berry or drupe. *Seeds* 2-4, or often by abortion solitary.

1. LINOCIERA Sw.

Shrubs or *trees*. *Lvs.* opposite, simple, entire. *Fls.* usually in umbels, heads or cymes, collected into terminal or axillary panicles on the younger branches. *Cal.* small, 4-fid or 4-toothed. *Pet.* 4, free or joined in pairs at the base. *Fr.* an ovoid, oblong, or subglobose drupe, with a thick and bony or thinner and brittle endocarp. *Seeds* solitary or sometimes 2-3.

1. **L. caribaea** (Jacq.) Knobl. San Maria.
Chionanthus caribaea Jacq.
Linociera compacta R. Br.
Mayepea caribaea (Jacq.) Kuntze

Knoblauch in Bot. Centralbl. lxi. 87 (1895): Griseb. Fl. 405: Urb. Symb. Ant. 4. 488; 8. 533: Britt. & Wils. Sci. Surv. Porto Rico 6. 79.

Tree, usually small, but attaining 15 m. or more; young shoots and petioles pubescent; *lvs.* elliptical-oblong, 10-15 cm. long, 3-5 cm. wide, usually long-acuminate at apex, narrowed gradually at base to *petioles* 1-1.5 cm. long, firm in texture, glabrous except for tufts of hairs in the axils of the veins beneath; *panicles* terminal and axillary, pubescent; *bracts* linear; *fls.* commonly in threes on the tips of the panicle branchlets; *pedi.* very short or none; *cal.* about 1 mm. long, thickly pubescent; *petals* white, linear, 1-2 cm. long; *drupes* ovoid, 1-2.5 cm. long.

Forests in moist or dry districts, Trinidad and Tobago.
 West Indies generally; Margarita Is., Venezuela.

FAMILY 2. APOCYNACEAE

By E. E. CHEESMAN *

Trees, shrubs or climbers, rarely perennial herbs, usually laticiferous. Lvs. opposite, or whorled, rarely alternate, always simple and entire; stipules usually reduced or none, usually merely an interpetiolar ridge connecting the leaf-bases. Infl. terminal or axillary, usually cymose. Fls. hermaphrodite and regular. Calyx usually with a short tube and 5 (rarely 4) imbricate lobes, often bearing various glandular appendages (squamellae) within. Corolla tubular, variously shaped, sometimes with appendages at the throat within, its lobes 5, contorted (i.e. overlapping regularly either all to the right or all to the left). Stamens 5, inserted in the corolla tube, the filaments usually free, the anthers free or connivent round the stigma, sometimes adherent to the latter, often sagittate, the connective often produced at apex, the pollen granular. Ovary superior, of 2 carpels, syncarpous or apocarpous, the carpels when distinct below joined in a single common style; stigma variously thickened; ovules few to many. Fruit various, apocarpous or syncarpous, dry or fleshy; seeds often plumed or winged.

The family is generally ornamental, and several introduced members are grown in local gardens, among them *Beaumontia grandiflora* Wall., *Kopsia fruticosa* A.DC., *Nerium Oleander* L., (oleander) and *Tabernaemontana coronaria* (Jacq.) Willd. (crepe jasmine). The Lagos rubber tree, *Funtumia elastica* (Preuss) Stapf, was at one time planted on a small scale, but is now scarcely found outside botanical collections.

Stamens free, or only loosely joined to the stylar head; anthers without enlarged connective; corolla lobes usually overlapping to the left; seeds naked or winged, not plumed (Plumicroideae).

Ovary syncarpous throughout 1. *Allamanda*

Ovary apocarpous to the base, or nearly so; fruit often syncarpous.

* I am indebted to Dr. R. E. Woodson for determinations of Trinidad and Tobago material and for other assistance with this family, and have drawn freely on his published works in preparing the manuscript.—E.E.C.

Carpels containing numerous ovules.

Calyx bearing squamellae within 2. **Tabernaemontana**

Calyx without squamellae.

Trees.

Flowers large and showy ... 3. **Plumeria**

Flowers small (4 mm.) 5. **Aspidosperma**

Climbing shrub; fls. minute . 4. **Condylocarpon**

Erect herb; fls. large (5 cm.) 6. **Lochnera**

Carpels containing 1-6 ovules;
fruit fleshy.

Corolla not exceeding 1 cm. long 7. **Rauwolfia**

Corolla showy, 4-5 cm. long ... 8. **Thevetia**

Stamens firmly joined to the stylar head;
anthers with an enlarged connective;
corolla lobes usually overlapping to the right;
seeds usually plumed. (Echitoideae).

Anther-connectives with thick, blunt
basal lobes; lvs. glandular at
base of midrib above.

Infl. obscurely dichotomous; cor.
limb green 9. **Mesechites**

Infl. simple, racemose; cor. limb
yellow 10. **Mandevilla**

Anther-connectives with slender basal
lobes; lvs. not glandular (except
inconspicuously in *Forsteronia*)

Calyx bearing squamellae within.

Squamellae alternate with calyx
lobes or indefinitely distributed

Corolla salver-shaped, 3 mm.
long 11. **Forsteronia**

Corolla funnel-shaped, exceeding
3 cm. 12. **Odontadenia**

Squamellae as many as calyx lobes
and opposite to them 13. **Prestonia**

Calyx without squamellae 14. **Rhabdadenia**

1. ALLAMANDA L.

Shrubs, often scandent. *Lvs.* whorled. *Fls.* large, in few-flowered axillary cymes. *Cal.* 5-parted, the lobes lanceolate. *Cor.* funnel-shaped, the tube cylindrical below, bell-shaped at the throat, with ciliate scales at the throat within, the 5 broad lobes overlapping to the left. *Stam.* borne at the throat on very short filaments; *anth.* lanceolate, shortly sagittate at base, without appendages. *Ovary* syncarpous, 1-celled; *style* filiform; *stig.* with a basal reflexed membrane; ovules numerous on 2 parietal placentas. *Fruit* a spiny, globose or subglobose capsule; *seeds* numerous, dry, compressed, margined or winged.

1. *A. cathartica* L.

Griseb. Fl. 407: Britt. & Wils. Sci. Surv. Porto Rico 6. 86: Markgraf in Pulle, Fl. Surin. 4. 1. 10: Woodson in N. Amer. Fl. 29. 142.

Scandent *shrub*, glabrous or more or less pubescent; *lvs.* in whorls of 4 or 3 or the upper opposite, obovate to oblong-lanceolate, 5-12 cm. long, 2.5-6 cm. wide, shortly acuminate at apex, narrowed at base, thin to somewhat leathery in texture, on *petioles* 2-3 mm. long; *cal. lobes* ovate-lanceolate, 5-15 mm. long; *corolla* bright yellow, 7-9 cm. long and 6-8 cm. across when expanded, funnel-shaped, the proper tube 2-3 cm. long and about 2 mm. in diameter, the upper tube or throat widening to 2-3 cm., the lobes rounded, 2.5-3.5 cm. long and wide; *capsule* globose, about 4 cm. in diameter, densely covered with soft spines about 1 cm. long.

Possibly native, but more probably escaped from cultivation and naturalized, especially in coastal districts, Trinidad.

Probably native of north-eastern S. America; cultivated throughout the tropics, and found as an escape in many countries.

2. TABERNAEMONTANA L.

Shrubs to trees. *Lvs.* opposite, usually leathery, the two of a pair equal or unequal. *Infl.* few to many-flowered. *Cal.* deeply 5-parted, its lobes equal, small, bearing squamellae within. *Cor.* salver-shaped, with a cylindrical tube, more or less widened at the insertion of the stamens, the lobes overlapping to the left. *Stam.* variously inserted in the corolla tube; *anthers* free, without enlarged connective. *Ovary* apocarpous, with or without a

basal annular disc; *style* short or long; *stigma head* various; *ovules* many. *Fruit* of 2 spreading follicles, relatively short and thick, leathery or somewhat fleshy, indehiscent or tardily opening; *seeds* embedded among fleshy arils.

Cymes few-flowered.

Cor. tube abruptly widened at insertion of stamens; lobes greenish, reflexed; lvs. in somewhat unequal pairs 1. *T. attenuata*

Cor. tube not abruptly widened at insertion of stamens; lobes white, arching; lvs. in equal pairs 2. *T. undulata*

Cymes many-flowered.

Fls. white, borne with the leaves .. 3. *T. oppositifolia*

Fls. yellow to orange, borne when the tree is out of leaf 4. *T. psychotriifolia*

1. ***T. attenuata*** (Miers) Urb.

Bonafousia attenuata Miers

Anartia attenuata (Miers) Mgf.

Miers, Apoc. S. Amer. 51 (1878): Urban in Fedde, Repert. 13. 471 (1915): Markgraf in Pulle, Fl. Surin. 4. 1. 34 and 454 (1932) and in Notizbl. Bot. Gart. Berlin-Dahlem 14. 165 (1938).

Shrub or small *tree*; *lvs.* elliptical, 5-15 cm. long, 2-5 cm. wide, the two of a pair often markedly unequal in size, long-acuminate at apex, acute at base, on *petioles* 5-7 mm. long; *fls.* greenish, in few-flowered terminal and axillary cymes; *pedi.* 4-10 mm. long; *cal.* white, 3-4 mm. long, its lobes broadly ovate; *cor.* 2.5-3 cm. long, its *tube* 3 mm. in diameter at base, gradually narrowing to the insertion of the stamens, which is 1.5-2 cm. above base, then abruptly widening to 3-4 mm., *lobes* oblong, acute, 8 mm. long, reflexed in bloom; *stam.* sessile, *anth.* included in the throat, narrow, with short straight tails; *follicles* up to 3 cm. long 2 cm. thick, with a short abruptly curved beak, dehiscing to disclose about 40 seeds enclosed in bright orange-red arils.

Forests of the Northern Range and north-eastern districts, Trinidad.

Guiana and Northern Brazil.

2. **T. undulata** Vahl.
Bonafousia undulata DC.

Roi de mapipire

Griseb. Fl. 409 : Markgraf in Pulle, Fl. Surin. 4. 1. 30 and 454 (1932) and in Notizbl. Bot. Gart. Berlin-Dahlem 14. 166 (1938) : Marshall, Trees Trin. & Tob. 70.

Shrub or small *tree* ; *lvs.* broadly elliptical to narrowly oblong-elliptical, 8-18 cm. long, 2-7 cm. wide, the two of a pair equal in size, abruptly long-acuminate at apex, acute at base, shining above, dull, pale and prominently veined beneath, *petioles* 2-5 mm. long ; *fls.* in few-flowered terminal and lateral cymes ; *pedu.* up to 1 cm. ; *cal. lobes* 3 mm. long, ovate, white ; *cor. tube* white or pinkish, 2-3 cm. long, about 3 mm. in diameter at base, scarcely narrowing to the insertion of the stamens and only very slightly dilated at that point, the *lobes* white, yellow at base within, 1-1.5 cm. long, 5 mm. wide, spreading or more usually arching inward, not reflexed ; *follicles* 3.5 cm. long, 2.5 cm. wide and 2 cm. thick, with a very short or minute beak.

Called *Roi de mapipire* because an infusion of the root is a reputed cure for snakebite.

Forests in moist and wet districts, Trinidad.

The Guianas and northern Brazil.

3. **T. oppositifolia** (Spreng.) Urb.
Rauwolfia oppositifolia Spreng.

Urb. Symb. Ant. 4. 493 ; 8.541 : Britt. & Wils. Sci. Surv. Porto Rico 6. 89 : Woodson in N. Amer. Fl. 29. 110.

Shrub or small *tree* up to 12 m. ; *lvs.* narrowly oblong-elliptical to obovate-elliptical, 5-15 cm. long, 2-7 cm. wide, acuminate at apex, narrowed at base, on *petioles* 0.5-1.5 cm. long ; *infl.* corymbose, many-flowered ; *pedi.* about 7 mm. long ; *cal.* 2.5-3 mm. long, its lobes ovate, acute or bluntish ; *cor. tube* 1-1.5 cm. long, 2 mm. in diameter at base, *lobes* about as long, spreading ; *follicles* 3-4 cm. long, 1-1.5 cm. wide, sharply beaked.

Tobago : Herb. Trin. 11101, Williams, Roxburgh-Parlatuvier Road ; Sandwith 1802, Pigeon Hill, in Herb. Kew.

Porto Rico.

4. **T. psychotrifolia** H.B.K.

Borache ;
Wild Jasmine

Peschiera psychotrifolia Miers.

Griseb. Fl. 409 : Marshall, Trees Trin. & Tob. 69 : Markgraf in Notizbl. Bot. Gart. Berlin-Dahlem 14. 171 (1938).

Medium-sized tree, deciduous and flowering profusely when out of leaf; *lvs.* elliptical, 8-16 cm. long, 4-7 cm. wide, the two of a pair sometimes unequal, acuminate at apex, rounded or slightly narrowed at base, firm in texture, the midrib and veins impressed above and prominent beneath, the margins wavy, *petioles* 1-2 cm. long; *fls.* in dense terminal corymbose cymes, at first pale yellow, soon darkening to orange; *cal. lobes* oblong-ovate, 2 mm. long, reflexed; *cor. tube* 1 cm. long, dilated at base and narrowing upward, greenish, *lobes* oblique, 1 cm. long, glabrous without, hairy within especially towards the throat; *stam.* inserted at base of the corolla tube; *follicles* semicircular, 5 cm. long, 2.5 cm. wide and about 2 cm. thick; *seeds* nearly 1 cm. long.

Forests in both wet and drier districts, Trinidad.
Northern Venezuela and Colombia.

3. PLUMERIA L.

Trees or shrubs with stout, often hollow, branches. *Lvs.* alternate. *Fls.* usually large and showy, in terminal or pseudo-lateral cymes. *Cal.* small, deeply 5-parted. *Cor.* salver-shaped, its 5 equal lobes overlapping to the left. *Stam.* included; *anth.* not joined. *Carp.* 2, separate, partly joined to the calyx tube; *ovules* many. *Follicles* 2, separate; *seeds* dry, basally winged.

1. *P. rubra* L.

Frangipani

Griseb. Fl. 411; Britt. & Wils. Sci. Surv. Porto Rico 6. 87; Woodson in N. Amer. Fl. 29. 116.

Small tree, up to about 8 m., its branches somewhat fleshy and copiously milky; *lvs.* elliptical obovate to oblong-oblancoate, up to 40 cm. long, 15 cm. wide, acuminate to blunt at apex, narrowed at base, glabrous on both surfaces or more or less pubescent beneath, on *petioles* 2-10 cm. long; *fls.* of various colours, in large peduncled panicles; *pedicels* stout, 1.5-3 cm. long; *cal.* about 3 mm. long, its lobes ovate; *cor. tube* 1-2.5 cm. long, *lobes* rounded or blunt, 2.5-6 cm. long, firm and waxy in texture; *follicles* 10-30 cm. long, 1-4 cm. wide.

A native of Southern Mexico and Central America, widely planted not only in the West Indies but throughout the tropics. Included here because occasionally subsponaneous in secondary vegetation, but scarcely naturalized.

The species is typically red-flowered, but pink, yellow and white varieties occur.

4. **CONDYLOCARPON** Desv.

Climbing *shrubs*. *Lvs.* opposite or whorled. *Fls.* small, in terminal, corymbose, long-stalked cymes. *Cal.* 5-fid., glandless. *Cor.* salvershaped, the tube shortly cylindrical, constricted below the throat, the lobes overlapping to the left, with lateral appendages. *Stam.* inserted at the middle of the tube or higher; *anth.* small, ovate, without appendages. *Carpels* distinct; *style* short; *stig.* capitate. *Fruit* of 2 long woody lomenta, few-seeded, contracted between the seeds, breaking into indehiscent 1-seeded sections.

1. **C. intermedium** Muell.-Arg.

Griseb. Fl. 409.

Lvs. elliptical, 6-10 cm. long, 3-4.5 cm. wide, acuminate at apex, rounded at base, on *petioles* 0.5-1 cm. long; *fls.* yellowish (ex Griseb.) in lax cymes; *cal. lobes* ovate, spreading, barely 1 mm. long; *cor. tube* 1.5-2 mm. long, *lobes* nearly as long; *lomentum* 2-6-jointed, the joints ovoid, plano-convex, 2-3 cm. long, 1-1.3 cm. wide.

Herb. Trin. 1535, Crueger, Irois (1858) : 2767 Irois (1866) : s.n. Dannouse, Guanapo (1904), Trinidad. Not recently collected.

Guiana and Brazil.

5. **ASPIDOSPERMA** Mart. & Zucc.

Hard-wooded *trees*. *Lvs.* alternate. *Fls.* small, in many-flowered cymes. *Cal.* 5-parted, without squamellae. *Cor.* salver-shaped, its lobes overlapping to the left. *Stam.* inserted high in the corolla tube; *anth.* included, lanceolate, without appendages. *Carpels* distinct; *style* short; *stig.* broadened in a cuplike ring. *Fruit* of 2 follicles (or often only 1 developed), compressed; *seeds* flattened, with a broad papery wing.

1. **A. sessiliflorum** Muell.-Arg.

Griseb. Fl. 411.

Tree; *lvs.* oblong-elliptical, 4-12 cm. long, 2-4 cm. wide, rounded or blunt at apex and base, on *petioles* 5-7 mm. long; *fls.* in compact panicles, clustered at the tips of the branchlets; *cal.* 1.5 mm. long, its lobes ovate, acute; *cor. tube* about 3 mm. long, *lobes* 1 mm., ovate, bluntish; *follicles* 2.5-3 cm. long, 1-1.5 cm. wide, flattened, with a very short (1 mm.) beak.

Monos Is., Gasparce Is., Laventille, Trinidad.

St. Vincent.

6. LOCHNERA Reichenb.

Herbs. *Lvs.* opposite. *Fls.* axillary, 1-4 in each axil. *Cal.* 5-parted, without squamellae. *Cor.* salver-shaped, the *tube* constricted at the throat, the 5 lobes overlapping to the left. *Stam.* inserted immediately below the throat of the corolla; *anth.* barely included, lanceolate, without enlarged connective. *Carpels* distinct, oblong-ovate, alternating with nectaries or disc-scales of nearly equal size; *stig.* shortly cylindrical, hairy at the top and with a reflexed membrane below; *ovules* numerous. *Fruit* of 2 separate cylindrical follicles; *seeds* small, somewhat compressed.

1. *L. rosea* (L.) Reichenb. Periwinkle: Old Maid.
Vinca rosea L.

Catharanthus roseus G. Don.

Griseb. Fl. 410: Britt. & Wils. Sci. Surv. Porto Rico 6. 89:
 Markgraf in Pulle, Fl. Surin. 4. 1. 22: Woodson in N. Amer.
 Fl. 29. 124.

Rather stout herb, 40-80 cm. high, usually branched and becoming somewhat woody at base, finely pubescent; *lvs.* oblong to oblong-oblancoate, 4-8 cm. long, 1.5-3 cm. wide, blunt or rounded at apex, often with a very small pointlet, narrowing at the base into *petioles* 4-10 mm. long; *fls.* nearly sessile, in clusters of one to three in alternate leaf axils; *cal.* lobes linear-lanceolate, about 4 mm. long; *cor.* pink or white, the *tube* 2-3 cm. long, the spreading lobes 1.5-2.5 cm. long, broadly and obliquely ovate; *follicles* pubescent, 2-3 cm. long; *seeds* black, 2 mm. long, warty.

The typical form has pink flowers, but varieties occur with the corolla uniformly white (forma *alba* (Sweet) Woodson) or white with a pink or red eye (f. *ocellata* (Sweet) Woodson).

Commonly grown as an ornamental plant, and not infrequent as an escape on waste lands near habitation, but scarcely naturalized.

Cultivated and escaped throughout the tropics and subtropics.

7. RAUWOLFIA L.

Shrubs or small *trees.* *Lvs.* whorled. *Fls.* small, in loose, terminal or axillary stalked cymes. *Cal.* short, 5-parted, without squamellae. *Cor.* salver-shaped, the *tube* cylindrical, sometimes inflated at the base, the 5 lobes overlapping to the left. *Stam.* inserted at the middle of the corolla tube or higher; *anth.*

included, small, without appendages. *Carpels* distinct or joined above, each with 1 or 2 ovules; *stig.* thick with a basal ring or reflexed membrane. *Fruit* syncarpous, the carpels more or less completely joined by the mesocarp, forming a drupe containing 1 or 2 seeds.

Corolla lobes more than 2 mm. long,
slightly spreading 1. *R. Lamarckii*

Corolla lobes less than 2 mm. long,
virtually erect.

Lvs. in whorls of 3 2. *R. ternifolia*

Lvs. in whorls of 4 (rarely 3 or 5) ... 3. *R. hirsuta*

1. *R. Lamarckii* A.DC.

R. nitida Lam. (non Jacq.)

R. latifolia A.DC.

Griseb. Fl. 408 : Urb. Symb. Ant. 8. 543 : Britt. & Wils. Sci. Surv. Porto Rico 6. 91 : Woodson in N. Amer. Fl. 29. 136.

Shrub or small *tree*, up to 10 m. or more; *lvs.* in whorls of 3 or 4, unequal, ovate to narrow-elliptical, 2-13 cm. long, 1-6 cm. wide, acuminate at apex, rather abruptly wedge-shaped at base, glabrous; *petioles* 3-6 mm. long, inconspicuously glandular, especially towards the base; *infl.* much shorter than the leaves; *pedicels* 2-3 mm. long; *cal. lobes* ovate, acute to acuminate, 1-1.5 mm. long, inconspicuously ciliate; *cor. tube* 3-4 mm. long, somewhat narrowed at insertion of stamens, *lobes* 2-3 mm. long, rounded; *drupes* globose, obscurely lobed, slightly notched at apex, 6-8 mm. broad, 5-6 mm. long.

Trinidad : Toco (Herb. Trin. 12390, Marshall). Tobago : several localities, on dry coral cliffs.

Cuba, Porto Rico and Lesser Antilles; Margarita; Venezuela.

2. *R. ternifolia* H.B.K.

Griseb. Fl. 408 : Markgraf in Pulle, Fl. Surin. 4. 1. 23.

Small *shrub*; young *stems* very shortly puberulent, and with scattered protuberances which are apparently lenticels; *lvs.* in whorls of 3, usually unequal, ovate-lanceolate, 2-6 cm. long, 1-2 cm. wide, acute or acuminate at apex, rounded at base, glabrous above, minutely puberulent on the midrib and nerves beneath, *petioles* 1-2 mm. long, with numerous glands on the upper side; *fls.* about 4 mm. long, in few-flowered terminal and

axillary cymes; *peduncles* 0.5-1 cm. long; *pedicels* 1-2 mm., increasing slightly on the fruit; *cal.* bell-shaped, its lobes 1 mm. long, triangular, acute; *cor.* 3.5 mm. long, the *tube* inflated at base and throat, the *lobes* white, 1 mm. long, broader than long, notched at apex, slightly spreading when fully expanded but quickly fading to an erect position; *drupes* globose, obscurely lobed, 4-7 mm. broad, nearly as long, bright red until fully ripe, then blackish.

Woodlands and thickets in moist districts, Trinidad.
Northern S. America.

3. *R. hirsuta* Jacq.

Devil Pepper
Pimand Diabie
Matteroot

R. canescens L.

Griseb. Fl. 407: Urb. Symb. Ant. 8. 543: Woodson in
N. Amer. Fl. 29. 138.

Shrub, 1-2.5 m., softly pubescent throughout to glabrous; *lvs.* usually in whorls of 4 (3-5), very unequal, oblong-elliptical to obovate-elliptical, 1.5-13 cm. long, 1-5 cm. wide, acute to acuminate at apex, wedge-shaped at base, commonly glabrous above and pubescent beneath, on glandular *petioles* 1-7 mm. long; *infl.* much shorter than the leaves; *pedicels* 2-3 cm. long; *cal. lobes* ovate, acute to bluntish 1-1.5 cm. long, inconspicuously ciliate; *cor. tube* 2-4 mm. long, somewhat constricted at insertion of stamens, *lobes* 1-1.5 mm. long, rounded; *drupes* globose, obscurely lobed and somewhat flattened laterally, 5-8 mm. broad.

Trinidad; St. Ann's (Herb. Trin. 8879, Freeman) and several collections without locality. Tobago: Herb. Trin. 10425, Broadway, without locality.

West Indies; northern S. America; Central America and Mexico.

Doubtful Records.

R. biauriculata Muell.-Arq. is recorded from Trinidad by Grisebach (Fl. 408) apparently on the authority of Mueller. I can trace no evidence of any recent collection in the Colony, and regard this as a doubtful record. The species occurs in Hispaniola, Guadeloupe and Dominica, and a description can be found in N. Amer. Fl. 29 p. 136.

R. tetraphylla L. (*R. nitida* Jacq.) is represented by Herb. Trin. 1448 "Woods of Chaguanas", 1879. There is also a

Botanic Gardens specimen dated 1888, but no record of more recent collection. As the species is not otherwise recorded south of St. Kitts, I regard the Chaguanas specimen as probably mislabelled and exclude it. Descriptions may be found in Sci. Surv. Porto Rico 6, 90 and in N. Amer. Fl. 29, 136.

8. THEVETIA *Adans.*

Shrubs or small *trees*. *Lvs.* alternate. *Infl.* cymose, few-several-flowered. *Cal.* deeply 5-parted, with many squamellae within. *Cor.* funnel-shaped, the tube much shorter than the lobes, closed at the orifice by 5 small scales inserted above the stamens. *Ovary* apocarpous, surrounded by a fleshy disc; *ovules* 2-4. *Fruit* syncarpous, drupaceous, containing 2-4 large seeds.

1. **T. peruviana** (Pers.) K. Schum. Lucky Nut.
T. neriifolia Juss.

Griseb. Fl. 407: Woodson in N. Amer. Fl. 29, 133.

Small *tree*; *lvs.* linear, 8-12 cm. long, 0.7-1 cm. wide, acute, almost sessile, glabrous and shining above, paler beneath; firm in texture; *fls.* pinkish orange, few together in terminal and lateral cymes; *cal. lobes* lanceolate, 6-8 mm. long; *cor. tube* 1.5 cm. long, 3 mm. in diameter, widening abruptly in the throat. *lobes* 3 cm. long, oblique; *scales* closing the orifice of the corolla tube densely hairy; *fruit* 2.5-3 cm. long, 4 cm. wide.

Possibly native of Central America; frequently planted in tropical countries generally. In the Colony occasionally spontaneous in secondary growth after cultivation, but not naturalized.

9. MESECHITES *Muell.-Arg.*

Vines. *Lvs.* opposite, bearing 1-4 glandular emergences at the base of the midrib above. *Infl.* alternate-axillary, usually many-flowered. *Cal.* deeply 5-parted, the lobes with squamellae within. *Cor.* salver-shaped, the *tube* straight, dilated at the insertion of the stamens, the *lobes* overlapping to the right, reflexed. *Stam.* inserted about the middle of the corolla tube or a little higher; *anth.* included, connivent and adherent to the stigma; *connective* enlarged, bluntly 2-lobed, without linear apical appendages. *Carpels* distinct below the elongated *style*; *stigma* umbrella-shaped. *Fruit* of 2 distinct follicles, cylindrical, many-seeded; *seeds* plumed.

1. **M. trifida** (Jacq.) Muell.-Arg.
Echites trifida Jacq.

Griseb. Fl. 413 : Markgraf in Pulle, Fl. Surin. 4. 1. 40 and 456 ; Woodson in Ann. Missouri Bot. Gard. 20.630 and in N. Amer. Fl. 29. 145.

Plant glabrous ; *lvs.* ovate, ovate-oblong, or occasionally oblong-lanceolate, 5-10 cm. long, 2-6 cm. wide, usually rather abruptly acuminate, with a sharp pointlet, sometimes bluntish at apex, rounded at base, *petioles* 0.5-2 cm. long ; *infl.* about half as long as the leaves, the common *peduncle* 1-1.5 cm., *pedicels* 5-10 mm. long ; *fls.* usually numerous and crowded ; *cal.* green, its *lobes* ovate, 4 mm. long, with a thickened centre and scarious margins ; *cor. tube* about 3 cm. long, constricted about the middle, the lower part pink, the upper part and *limb* green, *lobes* obliquely obovate-oblong, 8-15 mm. long, reflexed ; *follicles* up to 30 cm. long, or longer, narrowly cylindrical, shortly curved at the tip ; *seeds* 1.5 cm. long, with a *plume* 2 cm. long.

Thickets in moist and wet districts, Trinidad.

Central America ; northern S. America.

10. MANDEVILLA Lindl.

Vines. *Lvs.* opposite or whorled, bearing few to several glandular emergences along the midrib above. *Infl.* racemose, usually many-flowered. *Cal.* deeply 5-parted, with squamellae opposite to the lobes at the base within. *Cor.* funnel-shaped or salver-shaped, the *tube* more or less pouched, the *lobes* overlapping to the right. *Anth.* connivent and adherent to the stigma ; *connective* enlarged below the pollen-sacs, bluntly 2-lobed or truncate. *Carpels* distinct below the elongated *style* and surrounded by 5 (-2) separate or concrescent nectaries ; *stigma* umbrella-shaped. *Fruit* of 2 distinct follicles, cylindrical, sometimes alternately inflated and constricted along their length, many-seeded ; *seeds* truncate, plumed.

Corolla salver-shaped, constricted at the mouth 1. *M. subsagittata*.

Corolla funnel-shaped, not constricted at the mouth.

Plant glabrous or nearly so ; bracts scarious 2. *M. symphitocarpa*.

Plant hairy ; bracts leafy 3. *M. hirsuta*.

1. *M. subsagittata* (R. & P.) Woods.

Echites subsagittata R. & P.

Griseb. Fl. 413 ; Woodson in Ann. Missouri Bot. Gard. 20. 743 (1933) and in N. Amer. Fl. 29. 154.

Stems slender; *lvs.* opposite, elliptical to oblong-elliptical, 4-10 cm. long, 1-3.5 cm. wide, rather gradually acuminate at apex, narrowed towards the base and then abruptly auricled, thin in texture, glandular along the midrib above, glabrous or variously pubescent, *petioles* 0.5-1 cm. long; *racemes* lateral, equalling or exceeding the subtending leaves, bearing 8-20 yellow or reddish flowers on *pedicels* 3-5 mm. long; *bracts* lanceolate 1-5 mm. long, scariosus; *cal. lobes* awl-shaped 2 mm. long; *cor. tube* 2-2.5 cm. long, 2 mm. in diameter at base, narrowing towards the insertion of the stamens, *lobes* broadly and obliquely obovate, 1-1.5 cm. long, spreading; *follicles* slender, moniliform (alternately inflated and constricted along their length, like a string of beads) 10-20 cm. long; *seeds* with a tawny plume 1.5 cm. long.

Hillsides and forest borders, Trinidad and Tobago.

Central America and Northern S. America.

2. **M. symphitocarpa** (G. F. W. Mey.) Woods.

Echites symphitocarpa G. F. W. Meyer.

Griseb. Fl. 414; Woodson in Ann. Missouri Bot. Gard. 19. 70 (1932) and 20. 755 (1933); Markgraf in Pulle, Fl. Surin. 4. 1. 458.

Plant glabrous or somewhat puberulent; *stems* relatively stout; *lvs.* elliptical to oblong-elliptical, 5-15 cm. long, 2-6 cm. wide, acuminate at apex, cordate at base, glandular along the midrib above, glabrous or slight puberulent beneath, *petioles* 5-12 mm. long; *racemes* lateral, about as long as the subtending leaves or finally longer, bearing in succession 5-20 yellow flowers; *pedicels* 3-5 mm. long, each subtended by a scariosus lanceolate bract 1-4 mm. long; *cal. lobes* narrowly triangular, about 5 mm. long *cor.* funnel-shaped, pale yellow and glabrous without (the tube whitish), lemon yellow within, streaked with fine lines of darker yellow, the proper *tube* 3-4.5 cm. long, 5 mm. in diameter, gibbous, the *throat* 2-3 cm. long, widening to a diameter of 2 cm. at the orifice, the *lobes* oblique, spreading, 2.5-3 cm. long and wide; ripe *follicles* not known.

Forest borders in southern districts (Irois, Erin and Cap de Ville) Trinidad.

Guiana.

3. **M. hirsuta** (A. Rich.) K. Schum. Savannah Flower

Echites hirsuta A. Rich.

Echites tomentosa Vahl.

Markgraf in Pulle, Fl. Surin. 4. 1. 43 : Woodson in Ann. Missouri Bot. Gard. 20. 762 and in N. Amer. Fl. 29. 155.

Plant hairy; *stems* twining, to 4 m. or more, relatively stout; *lvs.* elliptical, 5-12 cm. long, 2-5 cm. wide, abruptly acuminate at apex, cordate at base, glandular along the midrib above, paler beneath, softly hairy on both surfaces, *petioles* 0.5-1.5 cm. long; *racemes* alternate-axillary, finally about as long as the subtending leaf or a little longer, bearing 5-25 showy flowers, of which as a rule only one is open at a time; *pedicels* 2-5 mm. long, each subtended by a lanceolate, leafy or petaloid *bract* about 1 cm. long; *cal. lobes* lanceolate, 0.5-1 cm. long, acute, each with a single small scale opposite to its base within; *corolla* funnel-shaped, puberulent or pilose without, glabrous within, about 5 cm. across in bloom, with yellow lobes and a bright red throat, *tube* 3 cm. long, *limb* expanding from the throat to a diameter of 1.5 cm. at the orifice, *lobes* oblique, spreading, 1.5 cm. long or a little more; *anth.* 5 mm. long; *follicles* stout, 6-15 cm. long, alternately inflated and constricted at intervals along their length; *seeds* 8 mm. long, with a tawny plume about 1.5 cm. long.

Savannahs and forest borders and clearings, frequent, Trinidad and Tobago.

Central and South America.

11. FORSTERONIA G. F. W. Meyer.

Woody *vines*. *Lvs.* opposite or whorled, glandular at the base of the midrib above (inconspicuously so in the local species) or eglandular. *Fls.* small, in terminal or terminal and lateral cymose panicles. *Cal.* 5-parted, with or without squamellae within. *Cor.* salver-shaped with a short tube or almost rotate, 5-lobed, without appendages within. *Anthers* more or less exserted, joined to each other and to the stigma; *connectives* enlarged, arrow-shaped and peltate. *Carpels* distinct, surrounded by 5 separate or concrescent nectaries. *Follicles* separate or joined, containing many plumed seeds.

1. *F. Acouci* (Aubl.) A. DC.

Apocynum Acouci Aubl.

Thyrsanthus Schomburgkii Benth.

Forsteronia Schomburgkii Muell.-Arg.

Markgraf in Pulle, Fl. Surin. 4. 1. 60 (1932) and 467 (1937); Woodson in Ann. Missouri Bot. Gard. 22. 169 (1935).

Cal. lobes about 2 mm. long, reflexed 1. *P. quinquangularis*

Cal. lobes 5-10 mm. long, not reflexed.

Epistaminal appendages exerted .. 2. *P. exserta*

Epistaminal appendages wholly in-

cluded in the corolla tube 3. *P. Brittoni*

1. ***P. quinquangularis*** (Jacq.) Spreng.

Echites quinquangularis Jacq.

Haemadictyon venosum Lindl.

Griseb. Fl. 413 : Woodson in Ann. Missouri Bot. Gard. 23. 287 and in N. Amer. Fl. 29. 181.

Plant glabrous; *stems* relatively slender; *lvs.* oblong-elliptical to ovate-elliptical, 7-15 cm. long, 2.5-5 cm. wide, acute or shortly acuminate at apex, rounded or blunt at base, the veins suffused with red or purple and conspicuous, especially when young, *petioles* 1-3 cm. long; *infl.* racemose, simple, bearing 6-20 greenish-yellow flowers; *pedicels* about 1 cm. long; *bracts* 1-1.5 mm.; *cal. lobes* ovate-lanceolate, acuminate, about 2 mm. long, sharply reflexed, even on quite young buds; *cor. tube* greenish, 1.5-2 cm. long, very slightly constricted above the middle, slightly widened at the base, the epistaminal appendages only 1 mm. long, wholly included, *orifice* 3 mm. across, *lobes* yellow, oblique, about 1 cm. long, distally frilled and slightly inrolled; *anth.* 5 mm. long, sagittate; *follicles* united throughout their length, 20-35 cm. long and about 3 mm. thick.

In hedges and thickets, Trinidad and Tobago.

Martinique and Guadeloupe : also reported from Venezuela and the Guianas.

2. ***P. exserta*** (DC.) Standl.

Haemadictyon exsertum DC.

Prestonia tobagensis Urb.

P. Fendleri N.E. Br.

Urb. Symb. Ant. 5. 467 (1908) : Woodson in Ann. Missouri Bot. Gard. 23. 300 (1936) and in N. Amer. Fl. 29. 182.

Stems relatively slender; *lvs.* elliptical, 3-10 cm. long, 2-6 cm. wide, acuminate at apex, rounded or slightly narrowed at base, glabrous above, glabrous or minutely puberulent beneath, on *petioles* 3-8 mm. long, with numerous, minute, stipular appendages in the axils; *infl.* corymbose, simple, bearing

10-40 yellow flowers; *peduncles* shorter than the subtending leaves, glabrous or pubescent; *pedicels* 0.5-1.5 cm. long, puberulent; *bracts* 1-5 mm. long; *cal. lobes* linear to lanceolate 6-7 mm. long, not reflexed; *cor. tube* 1.5-1.8 cm. long, slightly constricted near the top, the epistaminal appendages exerted, about 5 mm. long, the *lobes* oblong, 8 mm. long, 5 mm. wide, reflexed or spreading; *anth.* 5 mm. long, oblong-sagittate; *follicles* long and slender, joined at least when young, up to 30 cm. long and 4 mm. thick.

In hedges and thickets, Trinidad and Tobago.

Venezuela, Colombia, Panama.

3. **P. Brittoni** N. E. Brown

N. E. Brown in Bull. Torr. Bot. Club 51. 5 (1924):
Woodson in Ann. Missouri Bot. Gard. 23. 316 (1936).

Plant glabrous; *stems* relatively stout; *lvs.* oval, 8-18 cm. long, 5-10 cm. wide, shortly and abruptly acuminate at apex, rounded at base, on *petioles* 1.5-2 cm. long, with a number of small teeth 1 mm. long in the position of stipules between the petioles; *cymes* axillary, bearing 40-50 brownish-yellow flowers; *peduncle* 3-5 cm. long; *pedicels* 1.5-2 cm. long; *cal. lobes* oblong, 1 cm. long, 4-5 mm. wide, acute to acuminate, rather thick, the internal squamellae 1 mm. long; *cor. tube* 1.5-1.8 cm. long, 3 mm. in diameter at base, very slightly constricted toward the orifice, with a conspicuously thickened rim at the mouth, the epistaminal appendages deeply included, *lobes* obliquely obovate, nearly 1 cm. long; *follicles* unknown.

Only known from the type collection: Herb. Trin. 10009, Broadway, Heights of Aripo, Trinidad, January 1922.

14. **RHABDADENIA** Muell.-Arg.

Woody *vines*. *Lvs.* opposite, not glandular. *Infl.* a reduced cyme, often 1-flowered. *Cal.* 5-parted, without squamellae. *Cor.* funnel-shaped, with a straight cylindrical tube, conical or tubular throat and spreading, regular 5-lobed limb, the lobes overlapping to the right. *Anth.* connivent and adherent to the stigma; *connective* enlarged, sagittate, pilose on the back. *Carpels* distinct below the style, and surrounded by 5 distinct or somewhat concrescent nectaries. *Follicles* distinct; *seeds* plumed.

1. *R. biflora* (Jacq.) Muell.-Arg.

Echites biflora Jacq.

Griseb. Fl. 415 : Britt. & Wils. Sci. Surv. Porto Rico 6. 92 :
Markgraf in Pulle, Fl. Surin. 4. 1. 54 : Woodson in N. Amer.
Fl. 29. 186.

Plant glabrous ; *stems* relatively stout ; *lvs.* elliptical to obovate-oblong, 4-8 cm. long, 2-4 cm. wide, the apex rounded and bearing a short pointlet, the base gradually narrowing, somewhat leathery in texture, *petioles* 0.5-1.5 cm. long ; *cymes* lateral, the *peduncle* nearly as long as the subtending leaf or slightly longer ; *fls.* 1-5, white ; *cal. lobes* ovate-oblong, 1-2 mm. long ; *cor. tube* about 2 cm. long, 2 mm. in diameter at base, throat about as long, widening to 1.5 cm. at the orifice, *lobes* broadly obovate, 2-2.5 cm. long, spreading ; *follicles* cylindrical, 4-6 cm. long, 3 mm. in diameter, few-seeded ; *seeds* linear-fusiform, 25-30 mm. long, 1.5 mm. wide, with a terminal plume of silky hairs 1 cm. long or longer.

Swampy and muddy places near the sea, Trinidad.

Florida ; Greater Antilles ; Mexico to Colombia and Brazil.

FAMILY 3. ASCLEPIADACEAE

By E. E. CHEESMAN *

Perennial *herbs*, *subshrubs* or *shrubs*, sometimes low, erect or diffuse, more often climbing, sometimes to great heights, usually laticiferous. *Lvs.* opposite, *Stip.* none. *Infl.* usually cymose, umbelliform or racemiform, terminal or in one axil of each pair of upper leaves, rarely in both axils at one node. *Bracts* when present small, usually minute. *Fls.* hermaphrodite, regular, rarely very large, usually white, yellow, greenish, or livid purple. *Calyx* with a short or open tube and 5 imbricate or open lobes. *Corolla* gamopetalous, shortly or deeply 5-fid, the lobes valvate or contorted. *Corona* usually present, taking various forms and consisting essentially of outgrowths from the staminal filaments distinct or joined to each other, membranous or fleshy, sometimes joined also to the corolla. *Stam.* 5, inserted at or near the base of the corolla ; *filts.* short or completely joined to the corolla-tube ; *anth.* usually united with each other and with the style to form a complex organ known as the *gynostegium*. *Pollen* sometimes granular, the grains united in

* With much assistance by Dr. R. E. Woodson which is gratefully acknowledged.

tetrads, more often cohering in waxy masses called *pollinia*, of which there are 2 in each anther. *Translators* present between the anthers, of various structure, functioning in removal of the pollinia from the adjacent anther loculi. *Ovary* of 2 distinct carpels; *styles* 2, distinct up to a common head; *stylar head* large, 5-sided or round, flat, concave or convex, the stigmatic surface usually underneath or at the sides; *ovules* numerous in each carpel. *Fruit* of 2 follicles, or by abortion 1. *Seeds* ovate, oblong or elliptical, compressed, often margined, narrowed at the apex and usually crowned by a tuft of long silky hairs.

Erect herbs or shrubs.

Fls. violet or whitish; corona segments
spurred 1. **Calotropis**

Fls. orange-red or yellow; corona segments
hooded 2. **Asclepias**

Twining vines (occasionally procumbent).

Flowers small, the corolla lobes usually
1-2 mm. long, and not exceeding
3.5 mm. in local species 3. **Cynanchum**

Flowers larger, the corolla lobes at least
4 mm. (*Mateleia maritima*) and
usually much longer.

Pollinia pendulous; corona of 5 inflated
vesicles; fls. white 4. **Sarcostemma**

Pollinia sometimes more or less descend-
ing from the translator arms, but
essentially horizontal; corona not
vesicular; cymes rather laxly few-
several-fl'd.

Anthers relatively simple without
dorsal appendages; fls. brown,
reddish or green 5. **Mateleia**

Anthers hypertrophied and vesicular;
corolla lobes crisped; fls. cream .. 6. **Fischeria**

Anthers with dorsal appendages form-
ing what is sometimes called an
"inner corona"; fls. green 7. **Gonolobus**

Pollinia erect; cymes densely several-
many-fl'd.; fls. dark reddish
purple 8. **Marsdenia**

1. CALOTROPIS R. Br.

Shrubs or small *trees*. *Lvs.* subsessile. *Cymes* terminal or pedunculate in one axil. *Cal.* with numerous glands at the base within, its segments lanceolate. *Corolla* broadly bell-shaped, deeply 5-cleft. *Corona* of 5 segments, rather fleshy, toothed or lobed at the apex and bearing a short fleshy spur on the back. *Stam.* inserted near the base of the corolla; *filts.* joined in a short tube; *anth.* terminated by an inflexed membrane. *Stylar head* depressed, obscurely 5-lobed or 5-angled. *Follicles* short, thick, acuminate. *Seeds* tufted.

1. *C. procera* (Ait.) R. Br.

Mudar

Asclepias procera Ait.

Griseb. Fl. 420 : Urb. Symb. Ant. 4. 498 ; 8. 550 : Britt. & Millsp. Bah. Fl. 341 : Britt. & Wils. Sci. Surv. Porto Rico 6. 96.

Soft-wooded *shrub* up to 5 m. high ; *lvs.* obovate-oblong to broadly elliptical, up to 18 cm. long, 11 cm. wide, very shortly acuminate at apex, cordate at base, white-felted when young, *petioles* up to 1 cm. but usually very short ; *cymes* several - to many-flowered, on stout *peduncles* 4-8 cm. long ; *pedicels* 1-3 cm. long ; *cal. lobes* 4 mm. long ; *corolla* about 3 cm. across, pale violet, its *lobes* ovate ; *corona* about 1 cm. long ; *follicles* up to 8 cm. long.

A white-flowered variety occurs in cultivation.

Sometimes spontaneous as an escape from cultivation, usually near the sea ; scarcely naturalized ; Trinidad and Tobago.

Native of the Old World tropics, sometimes grown either for ornament or for the floss on its seeds, and naturalized in parts of the West Indies and continental tropical America.

2. ASCLEPIAS L.

Perennial *herbs*. *Cymes* umbelliform, usually many-flowered, sometimes loose and few-flowered. *Cal.* 5-10-glandular at the base within ; its segments acute. *Corolla* flat or reflexed, its lobes usually valvate. *Corona* of 5 segments, inserted on the staminal tube, erect, concave-hooded, with a ligule within. *Stam.* inserted at the base of the corolla ; *filts.* joined in a tube ; *anth.* terminated by an inflexed membrane. *Stylar head* nearly flat, 5-sided or obscurely 5-lobed. *Follicles* rather thick, acuminate, smooth. *Seeds* tufted.

1. *A. curassavica* L. Matac; Wild Ipeacuanha.

Griseb. Fl. 419; Urb. Symb. Ant. 4. 497; 8. 550; Britt. Fl. Berm. 296; Britt. & Millsp. Bah. Fl. 341; Britt. & Wils. Sci. Surv. Porto Rico 6. 95.

Herb, 20-80 cm. high, erect, sparsely branched; *lvs.* oblong-lanceolate, thin, 5-12 cm. long, up to 4 cm. wide, the upper ones narrower than the lower, acute at both ends; *petioles* 0.5-1.5 cm. long, connected at the node by a distinct interpetiolar ridge; *cymes* usually several in the upper axils, few-several-flowered; *peduncles* about $\frac{1}{2}$ cm. long; *pedicels* 1-2 cm.; *cal. lobes* linear-lanceolate, acute, 4 mm. long; *corolla lobes* orange-red to scarlet, ovate, 7 mm. long, strongly reflexed; staminal column distinct; *corona* golden yellow, the hoods erect, 3-4 mm. long, each bearing within an awl-shaped incurved horn, longer than the hood and arching over the stigma head; *follicles* 5-10 cm. long, fusiform, smooth, relatively thin walled.

A common weed of pastures, roadsides and waste lands, Trinidad and Tobago.

South-eastern U.S.A., West Indies and continental tropical America.

Note: A form with the corolla lobes as well as the corona golden yellow is forma *concolor* (Krug & Urb.) Woods. comb. nov. (*A. curassavica* L. var. *concolor* Kr. et Urb. in Urb. Symb. Ant. 1. 389). This has been found in Trinidad (Herb. Trin. 10114, Williams, Heights of Aripo, in cacao, 1922) but is rare.

A form with the corolla white, *A. curassavica* forma *nivea* (L.) Woods. comb. nov. (*A. nivea* L. Sp. Pl. 215. 1753), occurs widely in the Antilles, but has not been found in Trinidad or Tobago.

3. *CYNANCHUM* L.

Plants twining or procumbent, the local species slender, and small-flowered. *Cymes* peduncled in one axil; *pedicels* filiform. *Calyx* 5-parted, with 5-10 glands at the base within. *Corolla* deeply 5-fid. *Corona* membranaceous, of 5 separate or united, laminate to filiform scales, occasionally compounded or with internal processes, rarely wholly lacking. *Pollinia* pendulous, ovoid or oblong, their faces broadly rounded or only slightly compressed. *Follicles* acuminate, smooth; *seeds* tufted.

Cymes umbelliform, much shorter than the leaves.

Gynostegium long-stipitate 1. *C. parviflorum*

Gynostegium sessile or short-stipitate.

Corona segments longer than the gynostegium 2. *C. Cheesmani*

Corona segments shorter than the gynostegium.

Plant usually prostrate; leaves up to 2 cm. long 3. *C. Freemani*

Plant climbing; leaves 3.5-4.5 cm. long 4. *C. Broadwayi*

Cymes racemiform or paniculate, nearly as long as the leaves, or longer.

Lvs. ovate or oblong-lanceolate, 2-6 cm. long 5. *C. trinitense*

Lvs. cordate, 9-17 cm. long 6. *C. albiflorum*

1. *C. parviflorum* Sw.

Metastelma parviflorum R. Br.

M. Paralias DC.

M. suberosum Griseb.

Sw. Prodr. Ind. Occ. 53; Griseb. Fl. 417; Schlechter in Urb. Symb. Ant. 1. 246; Britt. & Wils. Sci. Surv. Porto Rico 6. 97.

Slender climber, up to 4 m. or more, glabrous or nearly so; lvs. ovate to oblong-lanceolate 2-4 cm. long, 0.5-1.5 cm. wide, acute and apiculate at apex, rounded at base, on slender petioles up to 1 cm. long; cymes few-flowered, very shortly peduncled or almost sessile, pedicels 2-3 mm.; cal. lobes about 1 mm. long, ovate, acute, ciliolate; corolla white, greenish-white or yellowish, its lobes oblong-lanceolate, about 2 mm. long, white-puberulent along the margins within; corona segments linear-spathulate, erect; gynostegium long stipitate; follicles 3-5 cm. long.

Trinidad: Belmont, San Fernando Hill, Los Iros and Moruga. Bocas Islands, Tobago: Point opposite Melville Island to Charlotteville (Herb. Trin. 11412, Freeman and Williams).

Porto Rico, Lesser Antilles and Margarita.

2. **C. Cheesmani** Woods, nom. nov.

Metastelma decipiens Schltr. (non *Cynanchum decipiens*
C. K. Schneider).

Schlechter in Urb. Symb. Ant. 1. 249: Britt. & Wils. Sci. Surv. Porto Rico 6. 97.

Slender climber; *lvs.* ovate-oblong to oblong, 1.5-3 cm. long, 0.5-1.5 cm. wide, acute and apiculate at apex, rounded at base, on slender *petioles* 0.5-1 cm. long; *peduncles* very short or up to 6 mm. long; *pedicels* 2-3 mm.; *cal. lobes* oblong, blunt, about 1 mm.; *corolla* greenish-white, its *lobes* about 2 mm. long, puberulent along the margins within; *corona* segments linear-spathulate, erect, exceeding the sessile *gynostegium*; *follicles* not described.

Tobago: Eggers 5893, near Auchenskeoch (*vide* Schlechter); Broadway 3178, The Whim; Sandwith 1871. Bacolet, in dry shrubby thickets near the sea. Not recorded from Trinidad.

Porto Rico.

3. **C. Freemani** (N. E. Br.) Woods, comb. nov.

Metastelma Freemani N. E. Br.

N. E. Brown in Bull. Torr. Bot. Club 53. 468.

Plant usually prostrate, much branched, forming mats, the *stem* becoming woody at base and up to 1 cm. thick, the younger *branches* about 1 mm. thick, puberulous along two opposite rather broad lines with strongly curved, very short hairs; *lvs.* elliptical or elliptical-oblong, up to 2 cm. long, 1 cm. wide, rounded at both ends or broadly wedge-shaped at base, minutely apiculate at apex, entire, thick and somewhat fleshy; *petioles* 1-1.5 mm. long, minutely puberulous; *cymes* 3-10 mm. long, very shortly peduncled (almost sessile); *pedicels* 0.5-1 mm. long; *cal. lobes* 1 mm. long, oblong, rounded at apex; *corolla tube* 1-1.5 mm. long, *lobes* 1.5-2 mm. long, oblong, dull yellow; *corona* segments about 1 mm. long, white; *stigma head* purple; *fruit* not known.

Locally abundant on rocky cliffs between Balandra and Toco, Trinidad. Type in Herb. Trin. 11310, Freeman, June 1921. Re-collected August 1940 (Cheesman and Baker in Herb. Trin.).

Endemic.

4. **C. Broadwayi** (*Schltr.*) *Woods.* comb. nov.
Decastelma Broadwayi *Schltr.*

Schlechter in *Urb. Symb. Ant.* 1. 265; N. E. Brown in *Bull. Torr. Bot. Club* 51. 5 (note under *D. trinitense*).

High climber; branches slender, round, minutely puberulent, becoming glabrous; *lvs.* elliptical or oblong-elliptical 3.5-4.5 cm. long, about 1.5 cm. wide, apiculate, on short puberulous *petioles* 3 mm. long; *infl.* few-flowered; *pedicels* about as long as the *petioles*; *cal.* lobes oblong, blunt, much shorter than the corolla; *corolla* 2 mm. long, its *lobes* oblong, blunt, about as long as the *tube*, white-bearded within; *corona* segments shorter than the staminal column and pressed close to it, broader than long, and somewhat truncate at the 3-toothed top, the middle tooth being minute; *gynostegium* subsessile; *fruit* apparently not known.

Herb. Trin. 9087, Britton and Freeman, from Mt. Tucuche has been tentatively determined as this species, but the specimen is immature and barren, and the record must be considered dubious.

Authentically known only from Grenada (Broadway 474 and 1483).

5. **C. trinitense** (*N. E. Br.*) *Woods.* comb. nov.
Decastelma trinitense *N. E. Br.*
N. E. Brown in *Bull. Torr. Bot. Club* 51. 5.

Stem twining, up to 2 mm. thick at the flowering part, with internodes 2-3 cm. long, minutely puberulous, brown; *lvs.* ovate or oblong-lanceolate, 2-6 cm. long, 1.5-3 cm. wide, acuminate at apex, rounded at base, on *petioles* 4-6 mm. long; *infl.* racemiform, longer than the leaves; *pedicels* 2-2.5 mm. long; *cal.* lobes less than 1 mm. long, ovate, blunt, thinly and very minutely puberulent; *corolla* about 3 mm. across, its *tube* less than 1 mm. long, the *lobes* about 1 mm. long, ovate, subacute, minutely and densely puberulent within, each sinus with a thickening which nearly or quite touches the staminal column, forming 5 small pocket-like entrances to the tube at the base of the lobes; *gynostegium* subsessile, somewhat conical, truncate at the apex; *corona* segments minute, pressed close against the back of the anthers and shorter than the latter; *fruit* not known.

Known only from the type collection (Herb. Trin. 6419. Dannouse, collected in 1898) Trinidad, locality not recorded.

6. **C. albiflorum** (*Urb.*) *Woods.* comb. nov.
Metalepis albiflora *Urb.*

Urban in *Fedde, Repert.* 16. 37 (1920).

Stems twining, angulate-striate, glabrous, with internodes about 20 cm. long; *petioles* 4-9 cm. long; *lvs.* cordate, 9-17 cm. long, 7-14 cm. wide, contracted at apex to a narrow acumen 1-2 cm. long, glabrous, papery in texture, furnished on the upper surface at the insertion of the petiole with several linear emergences about 1 mm. long; *infl.* paniculate, usually 2 at each node, 5-15 cm. long including the *peduncle* of 3-9 cm., minutely and densely pubescent in the upper part, either on one side or all round; primary *bracts* deciduous, the secondary linear-subulate 3-4 mm. long; *pedicels* 2-4 mm. long; *cal.* lobes linear, 5 mm. long; *corolla* rotate, whitish, fragrant, 3.5 mm. long, joined for about one-sixth of its length and somewhat fleshy, its *lobes* ovate or narrowly ovate, rather acute, the margins recurved, glabrous outside, densely clothed inside at the margins and towards the tip with whitish hairlike papillae; *corona* segments squarish, shorter than the gynostegium; *pollinia* ovate-elliptical, curved.

Not seen; description adapted from Urban.

Tobago: The Widow, Broadway 4794 (*type*). Apparently known only from the type collection.

4. SARCOSTEMMA R. Br.

Climbers. *Cymes* umbelliform, peduncled in one axil. *Cal.* small, 5-parted. *Corolla* broadly bell-shaped or nearly flat, 5-lobed. *Corona* of 5 closed inflated vesicles, joined at the bases by a fleshy ring adnate to the throat of the corolla. *Stam.* inserted on the base of the corolla, the *filaments* joined in a short tube, the *anthers* terminated by an inflexed membrane. *Pollinia* pendulous. *Follicles* elongated, smooth.

1. S. clausum (Jacq.) R. & S.

Asclepias clausa Jacq.

Sarcostemma Brownei G. F. W. Meyer.

Philibertia clausa K. Schum.

Funastrum clausum Schlechter.

Griseb. Fl. 419: Schlechter in Fedde, Repert. 13. 283: Urb. Symb. Ant. 8. 553: Britt. & Wils. Sci. Surv. Porto Rico 6. 99.

Glabrous *twiner*; *branches* slender; *lvs.* lanceolate-elliptical or oblong-elliptical, those seen 3-6 cm. long, 0.7-1.4 cm. wide, tapering gradually to a very acute point, rounded at base; *petioles* 3-5 mm. long; *cymes* 10-20-fl'd. on stout *peduncles* 4-7 cm. long; *pedicels* about 2 cm. long; *calyx* pubescent, its lobes triangular, acute, 3 mm. long; *corolla* 5-parted nearly to the

base, its lobes ovate, 7 mm. long, 5 mm. wide, blunt, greenish-white and silky without, paler and glabrous within; *corona* vesicles shining white, obovate-oblong, 3 mm. long, 1.5 mm. thick; *follicles* (ex Britt. & Wils., not seen by me) glabrous, 5-8 cm. long.

Trinidad: Oropouche Lagoon (Herb. Trin. 2747, Cruieger, 1864); Nariva Swamp (13352, Chenery 1938, noted as growing in 2 ft. of water); sea beach east of Icacos (Cheesman and Baker).

West Indies to southern Florida; northern S. America.

5. MATELEA Aubl.

Climbers or prostrate *herbs* or *subshrubs*. *Cymes* shortly peduncled or subsessile in one axil, usually few-flowered. *Corolla* varying from bell-shaped, with a well-developed tube, to subrotate with a very short tube or practically none, with or without a fleshy thickening at the throat (*jaucal annulus*), the lobes (in local species) spreading. *Corona* various, consisting usually of outer and inner units; the outer free and entire or lobed, or concrescent, sometimes adnate to the corolla throat; the inner either close to the outer, essentially free from them or completely adnate, or borne on the staminal column rather high above the outer units. *Anthers* relatively simple, without dorsal appendages; *pollinia* horizontal or more or less descending from the translator arms. *Follicles* thick. *Seeds* tufted.

Corolla with a distinct bell-shaped tube 1. *M. hirsuta*

Corolla flat, with a very short tube or none.

Corolla lobes about 4 mm. long 2. *M. maritima*

Corolla lobes about 1 cm. long 3. *M. viridiflora*

1. ***M. hirsuta*** (Vahl) Woods, comb. nov.

Cynanchum hirsutum Vahl

Macrocepis hirsuta Schltr.

Macrocepis obovata H.B.K. *sens.* Griseb. Fl. 421 (non H.B.K.).

Schlechter in Urb. Symb. Ant. 1. 265 (excl. syn. *M. obovata*).

Strong *vine*, climbing to 7 m. or more; *stems* hirsute with spreading brownish hairs; *lvs.* broadly elliptical, up to 17 cm. long, 11 cm. wide, shortly and abruptly acuminate at apex, cordate at base, rather firm in texture, softly hairy on both

surfaces; *petioles* 1.5-4 cm. long; *cymes* few-flowered; *peduncles* 1-2 cm. long; *pedicels* very short (about 2 mm.); *bracts* linear, 0.5-1 cm.; *calyx lobes* ovate, acute 1 cm. long; *corolla tube* 8 mm. long, and as wide at its greatest diameter, narrowing slightly at the top, the orifice almost closed by a fleshy faucal annulus, *lobes* broadly ovate, obtuse, 8 mm. long and wide, brown in colour, slightly recurved; *corona* segments adnate to the corolla tube, each with a callous boss supporting the stigma head; *follicles* (usually only one developed) up to 12 cm. long, ovoid, acuminate, furnished with 7 prominent wings, 1-1.5 cm. wide, of which 2 dorsal and 3 ventral run the whole length, whilst the 2 lateral do not quite reach the apex of the follicle; *seeds* flat, ovate, 7 mm. long, serrate at base, acute at apex, with a plume 3.5 cm. long.

Southern Watershed Reserve and Irois, Trinidad.
St. Vincent.

2. **M. maritima** (Jacq.) Woods.

Asclepias maritima Jacq. Enum. 17. (1760)

Cynanchum maritimum Jacq. Sel. Stirp. Amer. 83
(1763)

Ibatia maritima (Jacq.) Dcne.

I. muricata Griseb.

Griseb. Fl. 421: Schlechter in Urb. Symb. Ant. 1. 280:
Urb. *ibid* 4. 500; 8. 555: Britt. & Wils. Sci. Surv. Porto Rico
6. 99: Woodson in Ann. Missouri Bot. Gard. 28. 222 (1941).

Twiner, stems up to 6 m. long, hairy, becoming corky at base; *lvs.* broadly ovate, 4-8 cm. long, 3-6 cm. wide, acuminate at apex, cordate at base, pubescent above, felted beneath, on slender *petioles* 1-2 cm. long; *cymes* few-several-fl., sessile; *pedicels* about 2 mm.; *cal. lobes* ovate-lanceolate, about 2 mm. long, hairy; *corolla* rotate, its *lobes* ovate-oblong, obtuse, twice as long as the calyx; *corona* simple, annular with 15 teeth; *follicles* 5-7 cm. long, thickly set with corky stipitate tubercles.

Only collected from Patos Is., which is no longer within the Colony.

Greater and Lesser Antilles; Curacao, and northern South America.

3. **M. viridiflora** (G. F. W. Meyer) Woods.

Cynanchum viridiflorum G. F. W. Meyer

Gonolobus viridiflorus R. & S.

G. ciliatus Schltr.

G. rostratus R. Br. *sens.* Griseb. Fl. 420 (non R. Br.)

Vincetoxicum viridiflorum Standl.

Schlechter in Urb. Symb. Ant. 1. 282 (1899) : Woodson in Ann. Missouri Bot. Gard. 28. 235 (1941).

Slender *vine*; young *branches* purplish, hairy; *lvs.* broadly elliptical to ovate, 3-5 cm. long, 2-3 cm. wide, acuminate at apex, cordate at base, glabrous except for a few hairs on the nerves beneath and on the margins; *petioles* 1-3 cm. long; *peduncles* about 1 cm., *pedicels* 1.5-2 cm. long; *cal. lobes* lanceolate, 7 mm. long, acute, ciliate on the margins; *corolla* flat, 3-4 cm. across, yellowish-green, divided nearly to the base, the *lobes* ovate, acute or blunt, 1-1.3 cm. wide, glabrous without, sparsely furnished with thin hairs towards the base within and on the margins, the *throat* with an interrupted faucal annulus exterior to the true corona; *corona* annular; *follicles* 5-10 cm. long, crested.

May be confused with *Gonolobus Broadwayi*, which it superficially resembles, but distinguishable by its much broader corolla lobes, and the fleshy swellings between them representing the interrupted faucal annulus, as well as by the anther structure used in the generic key.

Hedges and thickets, Trinidad and Tobago.
Panama and northern South America.

6. FISCHERIA DC.

Climbing hairy *shrubs*. *Lvs.* often large. *Cymes* umbelliform or shortly racemose, pedunculate in one axil. *Cal.* 5-glandular at the base within, its segments narrow. *Corolla* almost flat, its *lobes* strikingly crisped. *Corona* annular. *Anthers* conspicuously hypertrophied and vesicular. *Pollinia* oblong or nearly ovate. *Stigma head* depressed, broadly 5-sided. *Follicles* thick, hard and hairy. *Seeds* tufted.

1. *F. havanensis* Dcne.

F. multiflora Dcne. sens. Griseb. Fl. 421 non Dcne.
Schlechter in Urb. Symb. Ant: 1. 267.

High *climber*; *stems* clothed with a short somewhat glandular puberulence sparsely interspersed with long hairs; *lvs.* ovate to elliptical, 6-16 cm. long, 3-10 cm. wide, acuminate at apex, cordate at base, rather sparsely pubescent above, densely so beneath, *petioles* 1-4 cm.; *cymes* several-flowered; *peduncles* 4-6 cm. long; *pedicels* about 1 cm.; *cal. lobes* awl-

shaped, 5 mm. long, hairy; *corolla lobes* ovate, blunt, cream-coloured, hairy on both surfaces, crisped; *corona* annular; *fruit* not seen and apparently undescribed.

Guapo, Tamana, Carmichael Road and road to Maracas Bay, Trinidad.

Cuba.

7. GONOLOBUS *Michx.*

Climbers. Lvs. cordate. *Cymes* loose, few-flowered, pedunculate or subsessile in one axil; *fls.* green, brownish or dark purplish. *Cal.* 5-glandular at the base within. *Cor.* flat, with a short tube or almost none, usually with a faucal annulus. *Corona* annular, borne at the base of the staminal column. *Anthers* with dorsal appendages, *Pollinia* more or less horizontal. *Stylar head* depressed, with rather prominent angles. *Follicles* usually thick, acuminate, *Seeds* tufted.

Cal. lobes broadly ovate, glabrous, 7 mm.

long 1. *G. Broadwayi*

Cal. lobes linear-lanceolate, hairy 13 mm. long 2. *G. tobagensis*

1. *G. Broadwayi* *Schltr.*

Schlechter in Urb. Symb. Ant. 7. 340.

High climber; *branches* terete, pubescent; *lvs.* oblong-elliptical, 5-12 cm. long, 2-7 cm. wide, acuminate at apex, deeply cordate at base, sparsely and shortly puberulent on both surfaces, *petioles* slender, 2-6 cm.; *cymes* several-flowered, *peduncles* 2-4 cm., *pedicels* 0.5-2 cm. long; *cal. lobes* broadly ovate, 7 mm. long, blunt or rounded at apex, glabrous; *corolla* rather dark green, 3-4 cm. across, 5-lobed nearly to the base, the *lobes* narrow lanceolate, acute, 7 mm. wide, minutely puberulent towards the base within; *fruit* (only rarely produced) of a single follicle, 10-15 cm. long, 6-7 cm. thick, dorsally double-crested from apex to base and laterally winged in the upper half; *seeds* 1 cm. long, with a plume about 4 cm. long.

Superficially resembles *Matelea viridiflora* but may be distinguished by narrower and darker green corolla lobes, as well as by the anther structure used in the generic key.

Roadside thickets in northern districts, Trinidad.

Endemic, so far as is known.

2. *G. tobagensis* Urb.

Urban in Fedde, Repert. 16. 37 (1919)

Climber; branches terete, clothed with spreading or somewhat deflexed hairs 1-1.5 mm. long which are at first yellow and later pale; *lvs.* ovate, 11-13 cm. long, 5-6 cm. wide, acuminate at apex, deeply cordate at base, rather stiffly hairy on both surfaces, the hairs dilated at base, *petioles* 5-7 cm. long; *cymes* few-flowered, *peduncles* 4-5.5 cm., *pedicels* 4.5-7 cm. long; *cal. lobes* linear-lanceolate, bluntish, 13 mm. long, shortly hairy on the back; *corolla* 2.3 cm. long, the *tube* 3 mm. long, the *lobes* lanceolate, gradually acuminate with the apex itself rather blunt, 6-6.5 mm. wide, minutely papillose towards the base within.

Not seen. Description adapted from Urban. Sandwith in Kew Bull. 1938 p. 368 adds with reference to his collection "corolla green; gynostegium pale reddish brown."

Tobago: The Widow, Broadway 4467 (*type*); Mount St. George—Castara Road, Sandwith 1840 (*det. ex descr.*).

Endemic, so far as known.

8. *MARSDENIA* R. Br.

Climbing *shrubs* or *subshrubs*, usually pubescent. *Cymes* umbelliform, terminal or pedunculate in one axil. *Calyx* with glands at the base within, its *lobes* usually blunt. *Corolla* bell-shaped or urn-shaped, shortly or deeply lobed, usually hairy in the throat. *Corona* segments erect, shortly free at apex. *Pollinia* erect, their faces uniformly rounded. *Follicles* usually thick, acuminate, smooth or longitudinally winged. *Seeds* tufted.

1. *M. macrophylla* (H.B.K.) Fourn.

Marsdenia maculata Hook.

Hooker in Bot. Mag. t. 4299 (1847): Griseb. Fl. 422: Schlechter in Urb. Symb. Ant. 1. 274.

Strong *climber*; *stems* terete and glabrous; *lvs.* elliptical or oblong-elliptical, up to 25 cm. long, 15 cm. wide, acuminate at apex, cordate at base, firm, almost leathery in texture, on *petioles* 1-3 cm. long; *cymes* densely several-many-flowered, shortly peduncled in one axil, the *peduncle* shorter than the *petiole*, *pedicels* about 7 mm. long; *cal. lobes* broadly ovate, 4 mm. long, rounded above, ciliate on the margins; *corolla* bell-

shaped with a short tube of about 2 mm., its lobes oblong, blunt, 7 mm. long, 3 mm. wide, greenish white without, dark reddish purple within, glabrous except for the ciliate margins; *corona* segments greenish yellow, lanceolate, acute, 3 mm. long; *fruit* not seen.

Trinidad: "Road from Joseph Village to Tarouba Estate" (1865); Morne Coco Road at 5th mile (1938); Los Iros beach (1940). Tobago: without locality (Freeman, May 1912); Store Bay (Sandwith 1816, Oct. 1937).

Northern South America.

FAMILY 4. LOGANIACEAE

Herbs, shrubs or trees of varied habit. *Lvs.* opposite or sometimes whorled, entire or toothed; *stipules* more or less developed or not apparent, free or cohering in a transverse line or sheath. *Fls.* regular and perfect, in terminal or axillary panicles, cymes or spikes, sometimes clustered in globose heads. *Cal.* usually small, its lobes 4-5, imbricate or valvate. *Cor.* funnel-shaped or salver-shaped, rarely bell-shaped, its lobes 4-5. *Stam.* as many as the corolla lobes and alternating with them, inserted in the throat or tube of the corolla; *anth.* 2-celled, opening lengthwise. *Ovary* superior, usually 2-celled; ovules numerous to solitary, axile or ascending from the base of each cell. *Fruit* a capsule, berry or drupe. *Seeds* netted, tubercled, or smooth, sometimes winged, containing copious endosperm.

Herbs:

- Fls. in usually simple spikes; capsule lobes
not horn-like at the summit 1. **Spigelia**
- Fls. in cymes; capsule lobes horn-like at
the summit: 2. **Cynoctonum**
- Woody climber 3. **Strychnos**

1. SPIGELIA L.

Herbs. *Lvs.* opposite. *Fls.* in one-sided spikes. *Cal.* 5-parted. *Cor.* tubular with 5 valvate lobes. *Stam.* 5 inserted in the corolla tube. *Ovary* 2-celled; *style* jointed, *stig.* papillose; *ovules* numerous. *Fruit* a 2-lobed capsule, circumscissile at base, septicidal above, opening in 2 valves. *Seeds* tubercled or netted.

1. *S. Anthelmia* L. Worm bush; Bomvier; Brinwilliers.

Griscb. Fl. 331 : Urb. Symb. Ant. 4. 489 ; 8. 534 : Britt. and Millsp. Bah. Fl. 329 : van Raalte in Pulle, Fl. Surin. 4. 104.

Glabrous herb ; stem usually with a pair of branches in the cotyledonary axils, then simple and leafless to a height of 10-20 cm., bearing one large and one small pair of leaves at the top, with another pair of branches in the axils of the smaller leaves ; lvs. sessile, their bases joined by truncate interpetiolar stipules, lanceolate to elliptical-lanceolate, the smaller 3-5 cm. long, 1-2 cm. wide, the larger about 10 cm. long, 4 cm. wide (smaller on the branches), acute at apex, entire, readily blackening on injury or drying, spikes terminal and axillary to the upper leaves, 5-15 cm. long ; cal. persistent, about 3 mm. long, deeply 5-parted, the lobes narrow ; cor. 1 cm. long, pink or lilac, funnel-shaped, its lobes ovate, 2 mm. long ; caps. tubercled, 4 mm. long, 6 mm. wide, deeply lobed at the septum ; seeds rough.

The plant is reputed poisonous to livestock.

In cultivated grounds and grassy places, Trinidad and Tobago.

West Indies, Floriad and cont. trop. America.

2. *CYNOCTONUM* J. F. Gmel.

Herbs, annual and erect or perennial and creeping. Lvs. opposite, membranous, the petioles connected by a narrow membrane or small stipules. Fls. small, unilateral on the sometimes elongated ultimate branches of cymes. Cal. lobes 5, lanceolate. Cor. urn-shaped, with a more or less swollen tube and contracted throat, lobes 5, short, valvate. Stam. included in the corolla tube, on short filaments. Ovary 2-celled, broad at the apex ; styles 2, short, at first joined but diverging after the flower opens ; ovules numerous in each cell. Capsule broad, truncate or 2-lobed above. Seeds small, rough.

1. *C. Mitreola* (L.) Britton

Ophiorrhiza *Mitreola* L.

Anonymos *petiolata* Walt.

Cynoctonum *petiolatum* (Walt.) Gmel.

Mitreola *petiolata* (Walt.) Torr. & Gray.

Britton in Mem. Torrey Cl. v. 258 (1894) : Urb. Symb. Ant. 4. 489 : Britt. & Wils. Sci. Surv. Porto Rico 6. 82 : Hochreutiner in Bull. New York Bot. Gard. vi. pp. 282-4 (1910).

Erect herb 20-60 cm. high, branching; *lvs.* lanceolate to ovate or oblong-ovate, 2.5-8 cm. long, 1-4 cm. wide, acute at apex, acute or rounded at base, sometimes narrowly decurrent along the petiole, entire, prominently veined, roughish above, paler beneath and glabrous except for very short stiff hairs along the veins; *petioles* 0.5-2 cm. long; *cymes* terminal and axillary; *fls.* numerous, sessile or nearly so, each subtended by a linear-lanceolate bract about as long as the calyx; *cal.* 1.5 mm. long, parted to below the middle; *cor.* white, slightly exceeding the calyx

Following Hochreutiner's treatment, the local material can be separated into two very distinct-looking varieties:

var. *campylocarpa* Hochr., l.c. 284.

Mitreola paniculata Wall. ex G. Don, Syst. iv. 171 (1837)?; ex D.C. Prodr. ix. 9 (1845); Griseb. Fl. 331; Progel in Mart. Fl. Bras. vi. pars i, 266.

M. petiolata (Walt.) Torr. & Gray, *vide* Hochr.

Cynoctonum paniculatum (Wall.) Robinson in Proc. Amer. Acad. xlv. 396 (1910).

Capsule 2.5 mm. broad, minutely tubercled, with the two horns at its apex incurved.

Trinidad: Herb. Trin. 2486 without data; Fredholm *s.n.* St. Ann's Hill, September 1906; 13528, Cheesman, above Lady Chancellor Road, September 1940. Also (in Herb. Kew.) Fendler 367, 416; Broadway 6328, Woodbrook; Purdie 60, St. Ann's.

America, especially in Northern S. America and Brazil; India and Burma.

var. *orthocarpa* Hochr. l.c. 284.

Mitreola oldenlandioides Wall. ex DC. Prodr. ix. 9 (1845).

M. petiolata (Walt.) Torr. & Gray of Griseb. Fl. 331; and of Progel in Mart. Fl. Bras. l.c.

Cynoctonum oldenlandioides (Wall.) Robinson l.c.

Capsule compressed, the acute horns at length widely divergent, and then 4-5 mm. across.

Trinidad: Herb. Trin. 2487 without data; 4455, Broadway, Princetown, December 1890. Not recently collected.

West Indies; Mexico; South-eastern U.S.A.; northern S. America; Tropical Asia.

Note: Mr. N. Y. Sandwith makes this comment: "It seems that the nomenclature and taxonomy of the forms of this species require further investigation when the evidence can be re-assembled. For instance, *Mitreola paniculata* Wallich was validly

published first by G. Don, a fact ignored by Hochreutiner and others, and was based on Wallich no. 4349, whereas its later publication by de Candolle was based on Wallich no. 1826; and both Bentham (Journ. Linn. Soc. i. 91) and Grisebach (Fl. 331) believed that de Candolle had misapplied the name. But Don certainly described the lobes of the capsule of *M. paniculata* as 'incurved at top'.

3. **STRYCHNOS** L.

Trees or shrubs, often (as in the local species) *climbers*. *Lvs.* opposite, 3-5 nerved, entire, their bases united by a stipular line. Climbing species with short axillary *tendrils*. *Cal.* 4-5-parted. *Cor.* salver-shaped with a long or a short tube, the limb 4-5-lobed. *Stamens* as many as the corolla lobes and alternating with them, inserted on the throat of the corolla; *filts.* short; *anth.* dorsally attached. *Ovary* 2-celled; *style* threadlike; *ovules* numerous. *Fruit* a berry, commonly globose. *Seeds* numerous or, by abortion, 1-2.

1. **S. pedunculata** (D C.) Benth.

Rouhamon pedunculatum DC.

Strychnos trinitensis Griseb.

Griseb. Fl. 407; Progel in Mart. Fl. Bras. vi. pars i, 275; Sandwith in Kew Bull. 1933. 397; and in Hook Ic. Pl. t. 3225 (1933).

High *climber*; young *branchlets* pubescent or becoming glabrous; *lvs.* ovate to elliptical-oblong or oblong-lanceolate, 4-12 cm. long, 2-6 cm. wide, shortly and bluntly acuminate at apex, abruptly wedge-shaped at base, shining, 5-nerved, intricately netted on both surfaces; *petioles* up to 7 mm. long, minutely pubescent, becoming glabrous; *infl.* pubescent, narrowly thyrsoid with opposite cymes, up to 4.5 cm. long; *pedi.* 1-3 mm. long; *cal. lobes* unequal, ovate or rather narrowly ovate-lanceolate, blunt, up to 1.3 mm. long, 0.6-1 mm. wide, thinly pubescent on the outer surface, fringed with hairs; *cor.* white, *tube* very slender, up to 6 mm. long, sometimes only 3 mm., very minutely papillose outside and often seeming almost glabrous, glabrous within towards the base, otherwise rather thinly pilosulous; lobes narrow, scarcely 3 mm. long, densely woolly within in the lower third; *stam.* subsessile, included; *ovary* and *style* glabrous; *fruit* globose, 5 mm. in diam. (on the Trinidad specimen).

Herb. Trin. 258 and 1529, Cruieger, Caura, Sept. 1849 (same collection in Herb. Kew., type or isotype of *S. trinitensis* Griseb.)

British Guiana.

FAMILY 5. GENTIANACEAE

BY R. O. WILLIAMS AND E. E. CHEESMAN

Bitter *herbs*, rarely *shrubs*. *Lvs.* opposite (except in *Nymphoides*), entire, glabrous, often sheathing at the base, without stipules, occasionally (as in *Leiphaimos*) reduced to scales. *Fls.* regular, perfect, terminal or axillary. *Cal.* 4-5-lobed, persistent. *Cor.* 4-5-lobed. *Stam.* as many as the corolla lobes and alternate with them, inserted in the tube or throat of the corolla. *Ovary* superior, 1-celled or partly, sometimes completely, 2-celled. *Capsule* many-seeded, usually dehiscent by two valves.

Terrestrial herbs or shrubs.

Lvs. scalelike, not green; fls. yellow or blue 1. **Leiphaimos**.

Lvs. normal, green.

Fls. clustered in the axils, white 2. **Enicostema**.

Fls. forming terminal inflorescences.

Cal. 4-lobed.

Cal. winged; fls. mauve 3. **Schultesia**.

Cal. not winged; fls. white 4. **Coutoubea**.

Cal. 5-lobed; fls. greenish-yellow 5. **Lisianthus**.

Water plant with floating leaves; fls. white .. 6. **Nymphoides**.

1. **LEIPHAIMOS** *Cham. & Schlecht.*

Low saprophytic *herbs*. *Lvs.* reduced to minute scales or wanting. *Fls.* terminal, solitary or in cymes. *Cal.* valvate. *Cor.* funnel-shaped or salver-shaped. *Caps.* oblong or linear. *Seeds* small.

Stem simple, with a solitary apical flower.

Cor. blue 1. *L. tenella*

Cor. yellow.

Cor. 2-3.5 cm. long 2. *L. aphylla*

Cor. 1-2 cm. long 3. *L. Feildenii*

Stem terminated by a contracted cyme 4. *L. trinitensis*.

1. **L. tenella** (*Hook.*) *Miq.*

Vohiria tenella *Hook.*

Voyria tenella *Guild. ex Griseb.*

Griseb. Fl. 425 : Sandwith in Kew Bull. 1931, p. 58 : Jonker in Pulle, Fl. Surin. 4. 1. 422.

Stem simple, 2.5-10 cm. high, or taller, 1-flowered ; *leaf scales* small, appressed, the lower opposite, the upper alternate ; *cal.* one fourth as long as the corolla, its lobes ovate-lanceolate ; *cor.* bluish-mauve, 8-12 mm. long, the *tube* 3-4 times as long as the lanceolate lobes, the *limb* 4 mm. across when expanded ; *ovary* with 2 appressed stipitate glands.

Santa Cruz (Herb. Trin. 1986, June 1850) ; Chaguanas (5130, January 1893) ; Mt. St. Benedict (13510, Baker, November 1939) Trinidad. Perhaps more frequent than the collections indicate, as the plant is easily overlooked.

West Indies ; Venezuela, Guiana, Brazil.

2. **L. aphylla** (Jacq.) Gilg

Gentiana aphylla Jacq.

Voyria uniflora Lam.

Griseb. Fl. 425 : Gilg in E. P. Pflanzenfam. 4. 2. 104 : Urb. Symb. Ant. 4. 490 : Jonker in Pulle, Fl. Surin. 4. 1. 419 : Britt. & Wils. Sci. Surv. Porto Rico 6. 84.

Stem simple, 6-20 cm. high, 1-flowered ; *leaf scales* opposite, 2-4 mm. long, sheathing the stem, the pairs distant ; *cal.* less than one-fourth as long as the corolla, its lobes lanceolate ; *cor.* salver-shaped, yellow, its slender tube 2-3.5 cm. long, dilated around the ovary and at the throat, its oblong-lanceolate lobes 5-7 mm. long, spreading ; *capsule* oblong-ovoid, 1-1.5 cm. long.

On humus in forests at Valencia, Aripo, Tucuche and Mount St. Benedict, Trinidad.

West Indies and tropical S. America.

3. **L. Feildenii** Urban

Urb. Symb. Ant. 7. 332 (1912)

Stem simple, 6-7 cm. high, erect and slender ; *leaf-scales* appressed, the lower more or less tubular-connate, up to 3 mm. long ; *flower* solitary at the apex of the stem ; *cal.* 3 mm. long, its lobes narrowly lanceolate ; *cor.* yellow, 18 mm. long, *tube* cylindrical, slightly widened round the ovary and manifestly thickened below the apex, 0.7 mm. thick at the middle, 1.5 mm. above, lobes orange when dry, obliquely and narrowly ovate, one-fifth as long as the tube or less ; *anthers* on short filaments inserted at the throat.

On dead wood in Government Forest Reserve, Tobago, (Feilden in herb. Broadway no. 3860) (*ex* Urban). Not otherwise known. Description adapted from Urban *loc. cit.*

In describing this species Urban points out its affinity with *L. aphylla* (Jacq.) Gilg, which, he adds, is larger and more robust in all its parts. *L. aphylla* however seems to be very variable in its size and vigour. Individuals in one collection may vary from 8 to 15 mm. in height and from 20 to 35 mm. in corolla length, with intermediates. Without access to the type specimen, it is therefore impossible to decide whether *L. Feildenii* is anything more than a small specimen of *L. aphylla*.

If *L. Feildenii* is indeed distinct, then Herb. Trin. 13512 (Baker, Mount St. Benedict, Trinidad, November 1939) may perhaps be referred to it. This collection consists of two individuals, one 7 cm. high with a corolla tube 12 mm. long, the other 11 cm. high with a corolla tube 11 mm. long. They were taken near to typical *L. aphylla*, and resemble it in everything but size.

4. *L. trinitensis* (Griseb.) Gilg
Voyria trinitensis Griseb.

Griseb. Fl. 425: Gilg in E. P. Pflanzenfam. 4. 2. 104.

Stem simple or branched at the base, 10-15 cm. high, terminated by a contracted cyme; *leaf-scales* opposite, somewhat spreading; *fls.* shortly stalked; *cor.* yellow, its tube about 1 cm. long, dilated round the ovary and at the throat, its lobes oblong-linear, bluntish, 4-5 mm. long; *capsule* 6-8 mm. long.

On humus in woods, Northern Range and Tamana, Trinidad.

Endemic.

Note: This species is very closely allied to, and perhaps a small-flowered form of, *L. aurantiaca* (Splitg.) Miq. of Guiana, for description of which *vide* Jonker in Pulle, Fl. Surin. 4. 1. 425 (1936).

2. ENICOSTEMA Blume.

Glabrous herb, erect or much branched at the base. *Fls.* small, in subsessile axillary heads. *Cal.* narrowly bell-shaped, deeply 5-lobed, not keeled. *Cor.* somewhat funnel-shaped, the cylindrical tube broadened above the middle, the lobes 5. *Caps.* oblong, 2-valved. *Seeds* finely pitted.

1. **E. verticillatum** (L.) Engl.

Gentiana verticillata L.

Slevogtia occidentalis Griseb.

Enicostema littorale Blume.

Griseb. Fl. 423 : Urb. Symb. Ant. 4. 490 ; 8. 536 : Britt. & Wils. Sci. Surv. Porto Rico 6. 83 : Hutch. & Dalz. Fl. W. Trop. Afr. 2, p. 183 (as *E. littorale* Blume).

Plant 30-60 cm. high ; *stems* sharply angled and roughish on the angles ; *lvs.* sessile, lanceolate, 5-8 cm. long, 1-2 cm. wide, acute at both ends, 3-nerved ; *fls.* about 7 mm. long, white ; *cal. lobes* awl-shaped, 5 mm. long ; *cor. lobes* about 1.5 mm., scarcely spreading ; *capsule* about as long as the calyx.

A weed in waste lands, Trinidad and Tobago.

West Indies ; Tropical Africa and Asia.

3. **SCHULTESIA** Mart.

Erect, annual *herbs*, simple or branched. *Fls.* subsessile or stalked in a terminal inflorescence. *Cal.* tubular or pyramidal, 4-winged or 4-keeled, the apex 4-fid. *Cor.* funnel-shaped, the tube contracted above the ovary, dilated at the throat, the lobes 4. *Stam.* 4. *Caps.* 2-valved. *Seeds* small, pitted.

1. **S. guianensis** (Aubl.) Malme

Exacum guianense Aubl.

Schultesia stenophylla Mart.

Griseb. Fl. 423 : Urb. Symb. Ant. 8. 537 : Malme in Ark. Bot. 3, no. 12, p. 9 (1904).

Herb, 15-30 cm. high ; *stem* 4-angled ; *lvs.* sessile, 2-3 cm. long, ovate to oblong, pointed ; *fls.* faded mauve, 1.5 cm. across ; *cal.* 1.5 cm. long, 4-winged, the lobes awl-shaped ; *cor. lobes* obovate, broadly rounded.

Widely distributed in moist places, Trinidad.

Cuba, Hispaniola, Cont. Trop. America.

4. **COUTOUBEA** Aubl.

Erect *herbs*. *Lvs.* opposite, rarely in whorls of 3, sessile or clasping the stem. *Fls.* white, sessile or shortly stalked, in terminal spikes or racemes. *Cal.* deeply 4-fid, lobes very acute, keeled, membranous at the margin. *Cor.* tube shortly cylindrical, lobes 4, spreading, narrow. *Stam.* 4, inserted in the tube. *Caps.* 2-valved. *Seeds* lightly pitted and netted.

1. **C. spicata** Aubl.
C. densiflora Mart.

Griseb. Fl. 423: Jonker in Pulle, Fl. Surin. 4. 1. 405.

Annual, 30-90 cm. high; *stem* usually simple, roundish; *lvs.* oblong-lanceolate, up to 7 cm. long, 2.5 cm. wide, acute or acuminate, rarely bluntish at apex, lobed at the base; *fls.* sessile in a dense terminal spike, each subtended by an awl-shaped bract and 2 bracteoles; *cal.* about 6 mm. long, its lobes much longer than the tube; *cor. lobes* acuminate, about 6 (-8) mm. long; *stam.* exerted; *capsule* as long as the calyx.

General in rather dry places, Trinidad and Tobago.
 West Indies and Northern S. America.

5. LISIANTHUS L.

Herbs, undershrubs or small trees. *Fls.* rather large, in loose, terminal, forked cymes. *Cor.* bell-shaped, greenish-yellow, with 5 short lobes. *Caps.* ovoid, exceeding the calyx; *seeds* small, polygonal.

Herb, 1-2.5 m.; *lvs.* relatively thin 1. *L. chelonoides*
 Small tree, 3-5 m.; *lvs.* leathery 2. *L. Brittonii*

1. **L. chelonoides** L.f.

Chelonanthus chelonoides (L.f.) Gilg.

Griseb. Fl. 423: Jonker in Pulle, Fl. Surin. 4. 1. 409.

Tall erect herb; *stem* round; *lvs.* ovate, 10-15 cm. long, 5-10 cm. wide, acute at apex, rounded or narrowed at base, sessile (at least the upper ones), prominently nerved; *pedicels* up to 1 cm. long; *cal.* 7 mm. long, the tube very short, the lobes broadly elliptical, rounded at apex; *cor.* greenish yellow, up to 3 cm. long, its lobes short and blunt; *capsule* ovoid, about 1.5 cm. long.

Roadsides and waste lands, especially in forest areas on light soils, Trinidad.

Guiana, Brazil, Peru.

2. **L. Brittonii** nom. nov.

Chelonanthus arboreus Britton (non *Lisianthus arboreus* Spruce ex Progel).

Britton in Bull. Dept. Agr. Trin. & Tob. 19. 230 (1922)

Tree up to 5 m. high, with few twiggy branches, glabrous throughout; *lvs.* elliptical, 5-8 cm. long, 2.5-4.5 cm. wide, acute or shortly acuminate at apex, narrowed at base, leathery in

texture, with the midrib prominent beneath but not the lateral nerves; *petioles* stout, 1-2 cm. long; *pedicels* stout, 6-12 mm. long, decurved in fruit; *cal.* 8-10 mm. long, its lobes oblong-elliptical to ovate, rounded at apex; *cor.* greenish-yellow, 2-2.5 cm. long, its lobes short and rounded; *capsule* conical to oblong, 2 cm. long, the persistent style up to 1.5 cm. long.

Summit of Mt. Tucuche, Trinidad; the only known locality. Type collection, Britton, Hazen and Mendelson 1295.

The species is much like *Lisianthus frigidus* Sw. of the Lesser Antilles, but according to Britton the latter is more woody, and has relatively thinner leaves, and solitary or few, much larger, flowers.

6. NYMPHOIDES Hill.

Perennial aquatic *herbs* with rootstocks. *Stems* erect, sometimes resembling *petioles*. *Lvs.* ovate or rounded, usually cordate at base, entire or toothed at the margin. *Fls.* in umbels on the summit of stems at the base of the *petioles*, seeming to arise from the *petioles*, or axillary. *Cal. tube* very short. *Cor.* rotate, with a short tube, deeply 5-lobed. *Stam.* inserted in the corolla tube between the lobes. *Capsule* ovoid, or oblong, indehiscent or breaking irregularly.

1. *N. Humboldtianum* (H.B.K.) O. Ktze.

Villarsia Humboldtiana H.B.K.

Limnanthemum Humboldtianum (H.B.K.) Griseb.

Griseb. Fl. 426: Urb. Symb. Ant. 4. 491; 8. 538: Britt. & Wils. Sci. Surv. Porto Rico 6. 85: Jonker in Pulle, Fl. Surin. 4. 1. 429.

Plant rooting in mud; *stems* erect, indistinguishable from the *petioles*; *lvs.* floating, rounded, up to 10 cm. or more broad, deeply cordate at base, margins entire or slightly wavy; *fls.* in sessile umbels of about 10, produced a few centimetres below the leaf blade, actually at the base of the *petiole*, but apparently from it; *pedicels* 3-6 cm. long, erect above the water, deflexed in fruit; *cal.* 5-lobed, the lobes lanceolate; *cor. tube* about 5 mm. long, yellow, the *lobes* white, oblong, bearded inside and fringed; *caps.* shorter than the calyx, beaked, many-seeded.

Old Caroni Road and Piarco, Trinidad.

Tropical America.

COHORT 8. POLEMONIALES

Corolla lobes imbricate :

Ovary cells or placentae with 2-many ovules ; style deeply bifid or styles 2, terminal ; fruit a capsule 1. **Hydrophyllaceae**

Ovary cells or placentae with 1-2 ovules ; style entire or shortly bifid, gynobasic ; fruit fleshy or breaking into pyrenes 2. **Boraginaceae**

Corolla limb more or less pleated, rarely imbricate :

Ovules solitary or paired in each cell, erect ; plant usually twining 3. **Convolvulaceae**

Ovules numerous, axile ; plant erect or scrambling, rarely twining 4. **Solanaceae**

FAMILY I. HYDROPHYLLACEAE

BY R. O. WILLIAMS

Annual or perennial *herbs*, sometimes almost *shrubs*, clothed with stiffish hairs, sometimes spiny. *Lvs.* alternate, without stipules. *Fls.* regular, hermaphrodite, 5-merous, subsessile in terminal, compound, scorpioid cymes, or in spikes or racemes, or solitary. *Cal.* deeply lobed. *Cor.* bell-shaped. *Stam.* as many as the corolla lobes and alternate with them, inserted on the tube ; *anth.* arrow-shaped. *Ovary* superior, usually 2-celled, sometimes incompletely 2-celled, or 1-celled ; *styles* or style branches 2 ; *ovules* 2-numerous in each cell. *Capsule* 2-valved. *Seeds* usually tubercled or netted.

Plant not spiny :

Plant up to 5 m. high, with flowers in terminal panicles 1. **Wigandia**

Plant about 20 cm. high ; flowers solitary or paired in the axils 2. **Nama**

Plant spiny ; flowers in compact panicles 3. **Hydrolea**

1. WIGANDIA H.B.K.

Tall, coarse, hispid *herbs*. *Lvs.* large, double-toothed. *Cymes* terminal, dichotomous; *fls.* sessile along one side of the scorpioid branches. *Cal.* segments linear. *Cor. tube* short, broadly bell-shaped, the *limb* spreading, its lobes imbricate. *Stam.* usually exserted; *filts.* hispid below the middle with reflexed hairs. *Caps.* 2-valved.

1. *W. caracasana* H.B.K.

Bot. Mag. t. 4575: Griseb. Fl. 477: Brand in Engl. Pflanzenreich iv. 251, p. 135 (1913).

Plant up to 5 m. high, densely hairy; *lvs.* ovate, up to 30 cm. long, 20 cm. wide, broadly and shortly acuminate at apex, rounded or slightly cordate at base, irregularly double-toothed, rough above, velvety beneath, *petioles* 5 cm. long; *fls.* mauve, in spreading much-branched panicles 50-60 cm. long, the individual scorpioid branchlets at length up to 15 cm. long; *cal.* 6 mm. long; *cor.* 1.5-2 cm. across the limb, the lobes ovate; *capsule* ovoid-oblong, 8 mm. long.

Dry places, Bocas Islands and extreme north-western coast of the mainland, Trinidad.

Venezuela to Mexico.

2. NAMA L.

Low *herbs*, much branched and pubescent. *Lvs.* alternate, entire. *Fls.* axillary, solitary or in pairs. *Cal.* 5-lobed. *Cor.* funnel-shaped or salver-shaped, 5-lobed, the lobes imbricate in the bud. *Stam.* inserted on the corolla tube. *Ovary* 1-celled or incompletely 2-celled; *ovules* numerous. *Caps.* 2-valved.

1. *N. jamaicense* L.

Marilaunidium jamaicense (L.) Ktze.

Griseb. Fl. 477: Urb. Symb. Ant. 4. 516; 8. 574: Britt. & Millsp. Bah. Fl. 356: Britt. Fl. Berm. 305: Britt. & Wils. Sci. Surv. Porto Rico 6. 122: Brand in Engl. Pflanzenreich iv. 251, p. 155 (1913).

Annual, 20 cm. high or less, the branches prostrate; *lvs.* obovate, 2-5 cm. long, obtuse or apiculate at apex, narrowed to a sessile and decurrent base, thin in texture, hairy; *fls.* solitary

or in pairs in the axils; *pedu.* about 4 mm. long; *cal.* segments linear, hirsute, about 5 mm. long; *cor.* white, funnel-shaped, about as long as the calyx, hairy without, its lobes broad and overlapping; *caps.* oblong.

Trinidad: Woodbrook, Herb. Trin. 11771, Broadway; also Broadway 6660 and 9126 in Herb. Kew. both from Woodbrook.

West Indies; continental America from Texas to Venezuela.

3. HYDROLEA L.

Herbs or subshrubs. Lvs. entire. *Fls.* blue, in compact cymes or short racemes at the tips of the branches. *Cal.* segments lanceolate. *Cor.* broadly bell-shaped to almost flat, its lobes imbricate. *Stam.* inserted at the base of the corolla; *filts.* often dilated at the base. *Ovary* completely 2-celled; *ovules* numerous. *Capsule* globose or ovoid.

1. *H. spinosa* L.

Aubl. Pl. Guiane t. 110: Griseb. Fl. 477: Brand in Engl. Pflanzenreich iv. 251, p. 181.

Viscid *herb* or *subshrub*, 20-60 cm. high or more, becoming somewhat woody at base; *stem* erect, with rather distant glandular hairs and pubescent axillary spines 13 mm. long; *lvs.* elliptical-lanceolate or lanceolate, 2.5-5 cm. long; *cor.* bright blue, 1 cm. or more across, its lobes rounded; *caps.* globose, 6-7 mm. long, equalled by the persistent calyx.

Trinidad material is placed by Brand under var. *eu-spinosa* Brand f. *vulgaris* Brand.

Wet places, Caroni, Carenage and Mon Jaloux, Trinidad.

West Indies; Mexico to Brazil, Paraguay and Peru.